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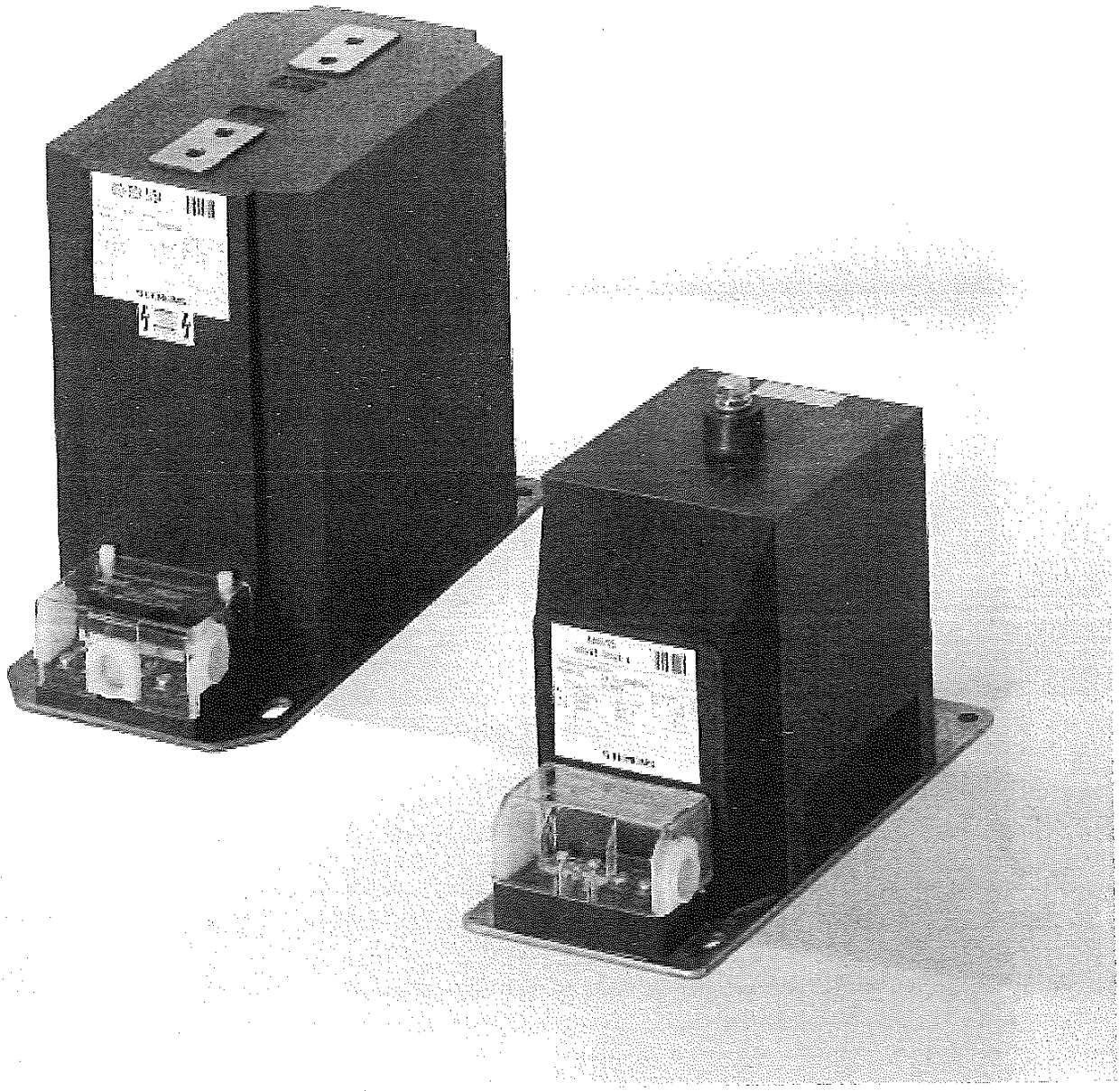

4M Protective and Measuring Transformers

Medium-Voltage Equipment
Selection and Ordering Data

Catalog HG 24 · 2009

Answers for energy.

SIEMENS

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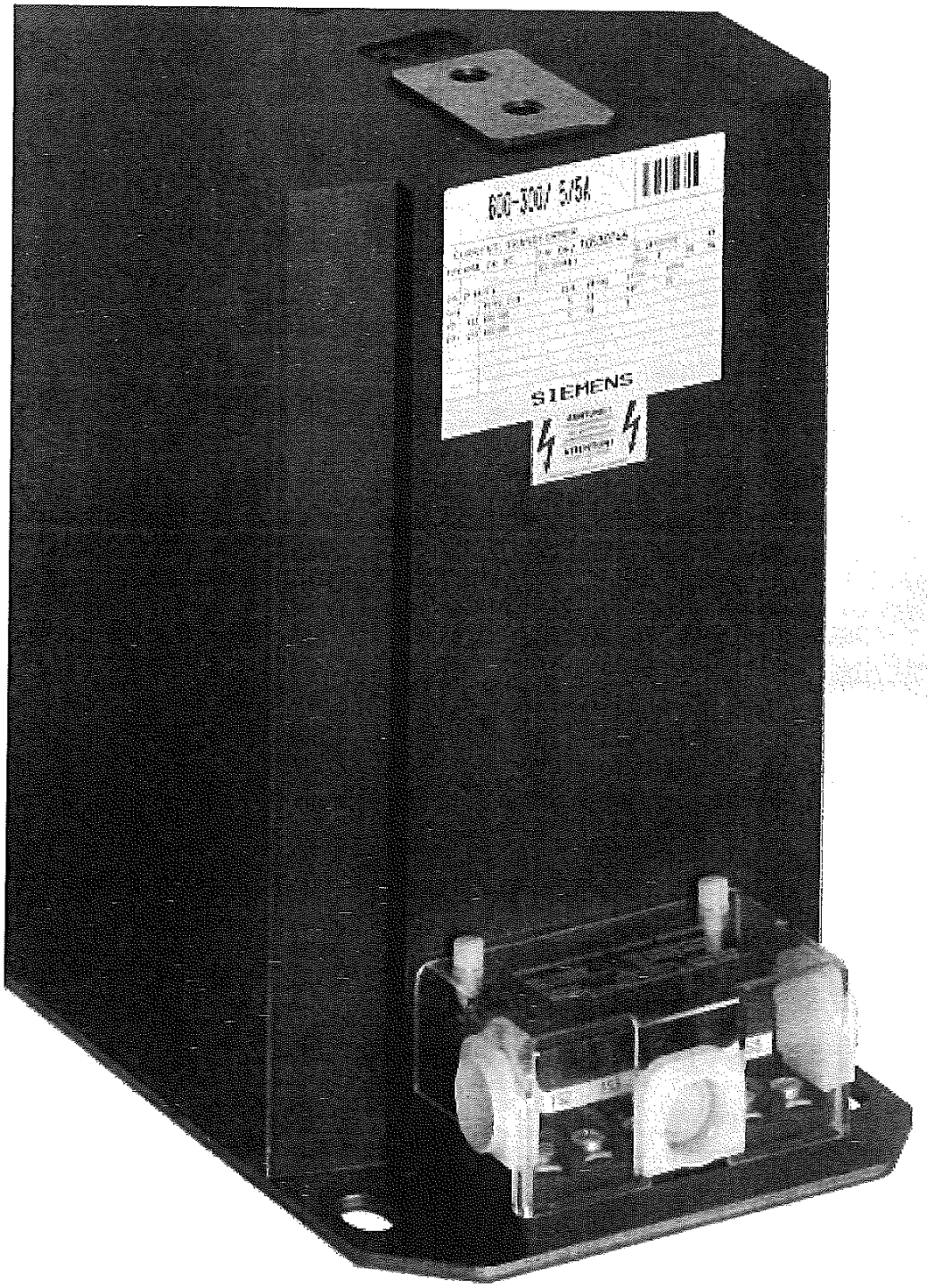

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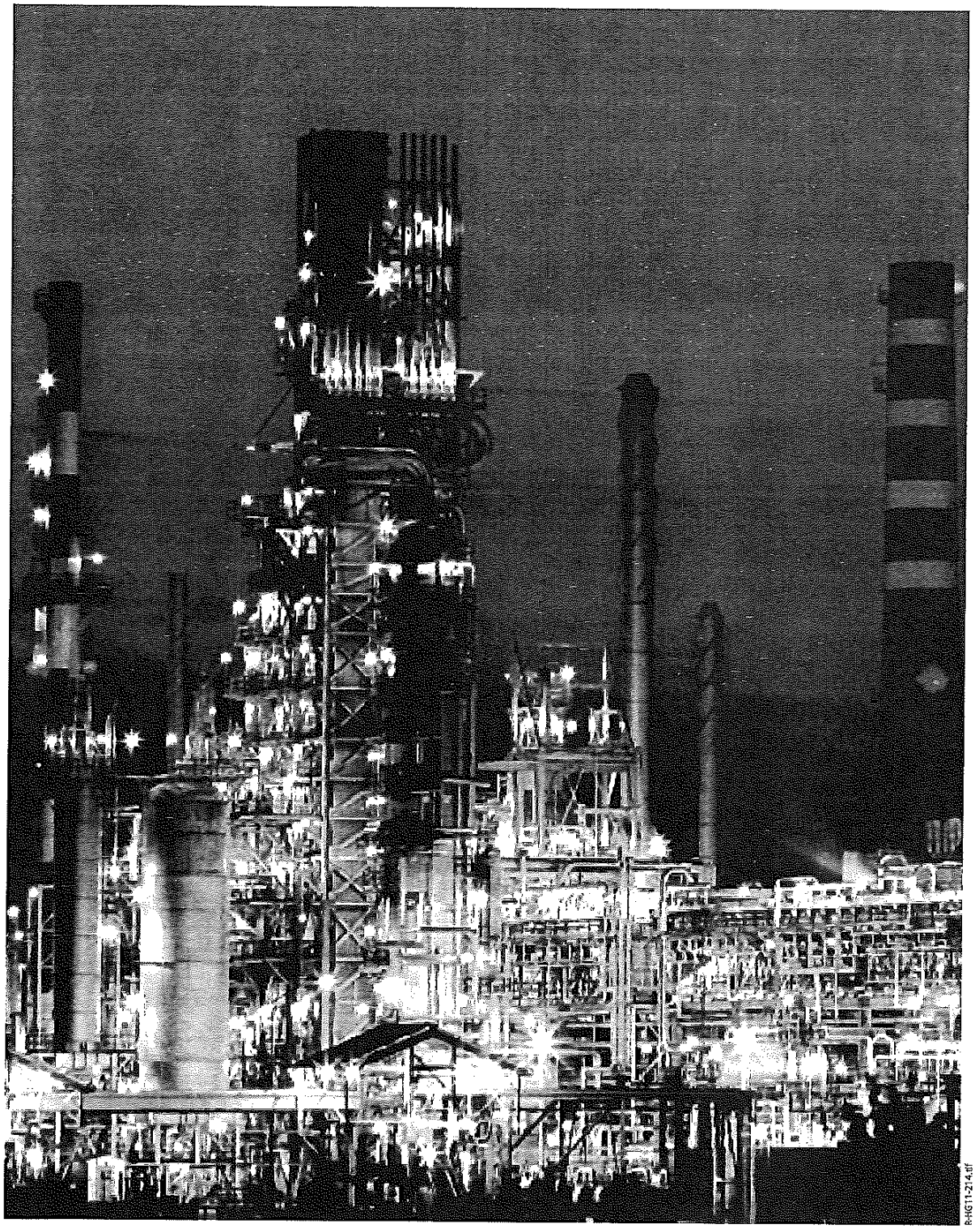
4M Protective and Measuring Transformers

Medium-Voltage Equipment
Catalog HG 24 · 2009

Invalid: Catalog HG 24 · 1994



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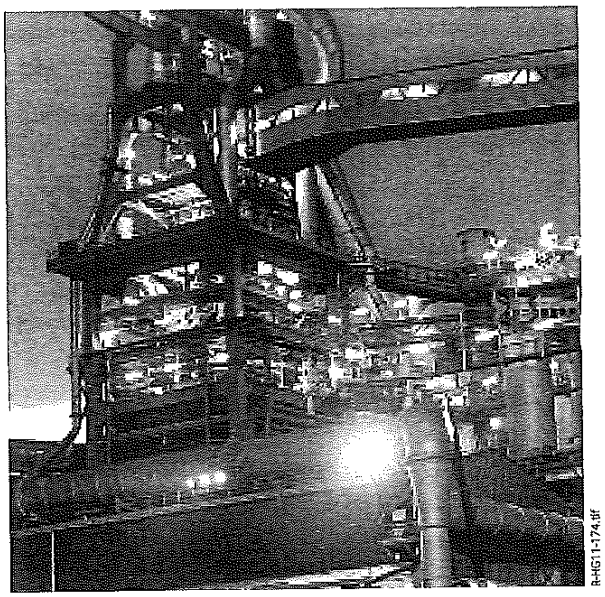

Industrial application: Refinery

Contents

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Protective and Measuring Transformers – The Adaptable

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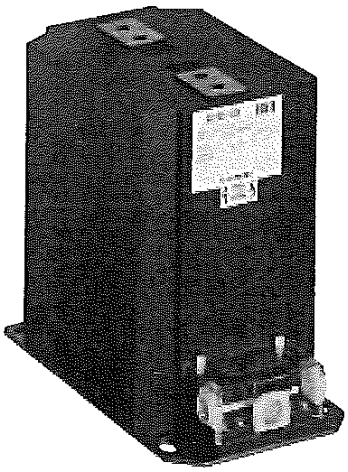
The task of instrument transformers is to transform high currents and voltages proportionally and in-phase into small current or voltage values for measuring or protection purposes. So they are used either to measure and record the transmitted power or to feed protection devices with evaluable signals, which enable the protection device to e.g. trip a switching device depending on the situation. Furthermore, they isolate the connected measuring or protection equipment electrically from live parts of the switchgear.

Current transformer



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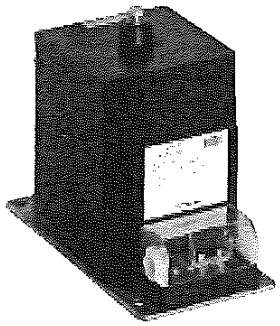
Current transformers can be regarded as transformers working in short-circuit, with the full normal current flowing through their primary side. Devices connected on the secondary side are series-connected. Current transformers can have several secondary windings with magnetically separated cores of the same or different characteristics. They can, for example, be equipped with two measuring cores of different accuracy class, or with measuring and protection cores with different accuracy limit factors.

Due to the risk of overvoltages, current transformers must not be operated with open secondary terminals, but only in short circuit or with the burden of the measuring equipment.

Voltage transformer



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Voltage transformers contain only one magnet core and are normally designed with one single secondary winding. If necessary, earthed (single-phase) voltage transformers are provided with an additional residual voltage winding (earth-fault winding) beside the secondary winding (measuring winding).

In contrast to current transformers, voltage transformers must never be short-circuited on the secondary side. The earth-side terminal of the primary winding is effectively earthed in the terminal box, and must not be removed in operation.

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Types of construction

Protective and measuring transformers are designed in different types of construction for the multiple installation requirements and operating conditions they are subjected to. They are electrical devices which convert primary electrical values – currents or voltages – into proportional and in-phase values that are adequate for the connected devices such as measuring instruments, meters, protection relays and similar. A distinction is made here between current and voltage transformers.

The following transformer types are available for selection in this catalog:

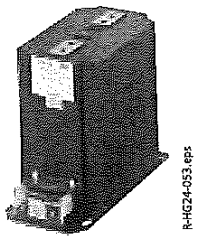
Current transformers

- Indoor support-type current transformer in block-type design
- Indoor support-type current transformer in single-turn design (e.g. bar-primary transformer)
- Indoor bushing-type current transformer in single-turn design
- Indoor bar-primary bushing-type current transformer
- Outdoor support-type current transformer

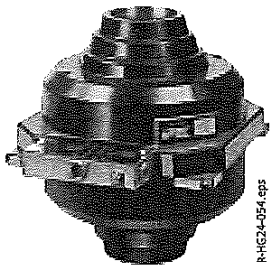
Voltage transformers

- Earthed (single-phase) or unearthed (double-phase) indoor transformers in different sizes
- Earthed (single-phase) or unearthed (double-phase) outdoor transformers in different sizes

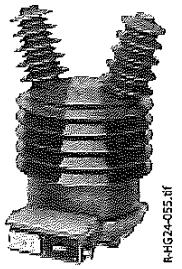
The transformers offered in the selection are only a part of the possible variations. If the transformer required is not shown, please clarify the feasibility with the responsible sales partner or the order processing department in the Switchgear Factory Berlin. The same applies to transformers according to the ANSI standard.



Example for transformer in block-type design



Example for bushing-type transformer



Example for outdoor transformer

Approvals/Certifications

In Germany, instrument transformers may only be used for commercial purposes, such as billing metering of electricity, if they have been approved once (type approval) by the Physikalisch-Technische Bundesanstalt (PTB) (Federal Physical-Technical Institute), and if every transformer is calibrated by an officially recognised inspecting authority.

Calibration is done by a calibration office, or by the transformer manufacturer on behalf of a calibration office. The test is documented by means of a test mark as well as a calibration certificate.

The calibration costs are charged in accordance with the official scale of fees.

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Current transformers

Current transformers can be regarded as transformers operating in short circuit, which carry the full rated current on the primary side. The devices on the secondary side are series-connected. They can have several secondary windings with mechanically separated cores of the same or different characteristics. Thus, current transformers can be designed e.g. with two measuring cores of different accuracy class, or with measuring or protection cores with different accuracy limit factors.

Due to the risk of overvoltages, current transformers must not be operated with open secondary terminals, but only in short circuit or with the burden of the measuring equipment.

Glossary of terms

Rated current I_N (r.m.s. value in A)

The rated primary (I_{PN}) and secondary (I_{SN}) current is the current that characterises the transformer, or the current it is designed for. Both values are given on the transformer rating plate. The rated primary current (I_{PN}) depends on the power system and is defined by the system operator.

Usual values for primary currents (in A):

10; 12.5; 15; 20; 25; 30; 40; 50; 60; 75

and their decimal multiples (preferred values are underlined).

Usual values for secondary currents: 1 and 5 A.

For technical reasons, but above all for economical reasons, 1 A is recommended as secondary current, especially if there are long measuring leads.

Rated continuous thermal current I_D (thermal strength)

The value of the current which can be permitted to flow continuously in the primary winding, the secondary winding being connected to the rated burden, without the temperature rise exceeding the values specified.

I_D is often equal to I_N, but it can also be defined as a multiple thereof.

Rated short-time thermal current I_{th}

The r.m.s. value of the primary current, flowing in case of short circuit, which a current transformer will withstand for 1 or 3 seconds without suffering harmful effects, the secondary winding being short-circuited.

Rated dynamic current I_{dyn}

The peak value of the primary current which a transformer will withstand, without being damaged electrically or mechanically by the resulting electromagnetic forces, the secondary winding being short-circuited.

Rated transformation ratio K_N

The ratio of the rated primary current to the rated secondary current. It is expressed as an unreduced fraction, e.g. 500 A/1 A.

Rated output S_N

The value of the apparent power (in VA at a specified power factor), for which the current transformer has to keep the accuracy class at the rated secondary current and with rated burden. Thus, the rated output describes the capacity of a current transformer to "drive" the secondary current within the error limits by means of a burden.

Current transformers can feature the following preferred rated outputs: 2.5 VA; 5 VA; 10 VA; 15 VA; 30 VA.

Rated burden Z_N

The burden is the apparent resistance of the devices connected on the secondary side (including all connection leads), for which the current transformer has to keep the stipulated class limits. The burden is normally expressed as apparent power in VA.

Current error F_i

The current error of a current transformer is (in %):

$$F_i = 100 \cdot \frac{K_N \cdot I_{sec} - I_{prim}}{I_{prim}}$$

K_N Rated transformation ratio
I_{prim} Actual primary current
I_{sec} Actual secondary current

Phase displacement d_i

The difference in phase between the primary and secondary current vectors, the direction of the vectors being so chosen that the angle is zero for a perfect transformer.

The phase displacement is said to be positive when the secondary current vector leads the primary current vector. It is usually expressed in minutes.

Limits of current error and phase displacement according to IEC 60044-1

Accuracy class	± current error in percent at rated current I_n				± phase displacement in minutes at rated current I_n			
	120 %	100 %	20 %	5 %	120 %	100 %	20 %	5 %
Measuring current transformers								
0.2	0.2	0.2	0.35	0.75	10	10	15	30
0.5	0.5	0.5	0.75	1.5	30	30	45	80
1	1	1	1.5	3	60	60	90	100
Protective current transformers								
5P	–	1	–	–	–	60	–	–
10P	–	3	–	–	–	–	–	–

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Measuring current transformers

Current transformers provided for the connection of measuring instruments, meters and similar devices (e.g. 10 VA Cl. 0.5 FS5).

Rated instrument limit primary current

The value of the primary current at rated burden and a composite error of 10 %.

Instrument security factor n

The ratio of rated instrument limit primary current to the rated primary current

Note:

In the event of short-circuit currents flowing through the primary winding of a current transformer, the thermal stress to the measuring instruments supplied by the current transformer is smallest when the value of the rated instrument security factor is small.

Accuracy class

The limit of the percentage current error at rated current I_N (see table).

Generally, current transformers are used for a measuring range of 5 % to 120 % of the rated primary current.

Special designs

Extended current ratings

Current transformers with ext. 200 % can be continuously operated at 2 x I_N, and keep the error limits of their class in the range up to 200 % of the rated primary current.

Protective current transformers

Current transformers intended to supply protection relays (e.g. 15 VA Cl. 10 P 10).

Accuracy class (identification P)

The limit of the percentage current error for the rated accuracy limit primary current.

Rated accuracy limit primary current

The value of primary current up to which the transformer will comply with the requirements for composite error.

Accuracy limit factor

The ratio of the rated accuracy limit primary current to the rated primary current.

Multi-ratio current transformers

If the ratio of current transformers has to be variable, e.g. for planned switchgear extensions, it is possible to use multi-ratio current transformers.

Primary multi-ratio

Only possible for wound-primary transformers (transformers with several primary turns) with a ratio of 1:2 (e.g. 2 x 600 A/1 A). Reconnection is made by re-arrangement of copper lugs in the primary connection area. Ratings, instrument security factors as well as the secondary internal resistance remain constant during reconnection.

Secondary multi-ratio

In single-turn and wound-primary transformers, this can be implemented by taps of the secondary windings (e.g. 2000–1000 A/1 A).

Ratings or instrument security factors change almost linearly with the ratio. If not stated otherwise, the specified rated data is always referred to the lower current value.

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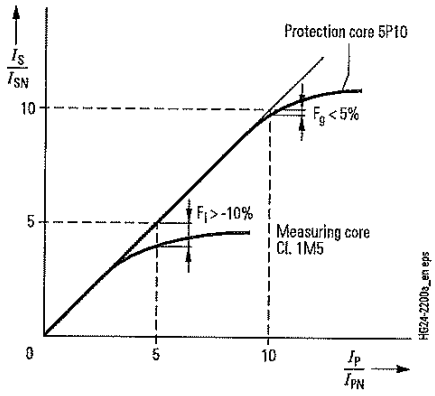
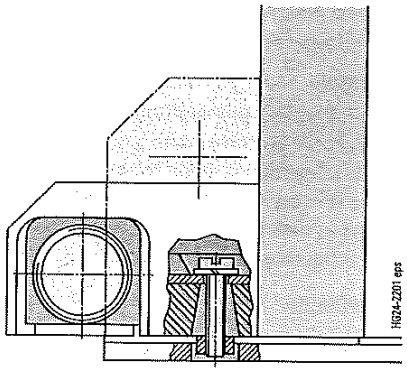


Overcurrent performance of current transformers when loaded with rated burden

F_i Current error
F_g Composite error



Earthing of the secondary winding, for example, in a 4MA7 current transformer

Performance in the event of overcurrent

In the event of an overcurrent, the rated secondary current increases proportionally with the rated primary current up to the rated instrument limit primary current.

The ratio of the rated instrument limit primary current to the rated primary current provides the instrument security factor assigned to the core. In accordance with this factor, the rated instrument limit primary current is subjected to specific error limits.

The measuring and protection cores place different demands on these error limits.

For measuring cores, the current error F_i is > –10 % in order to protect the supplied measuring devices, meters, etc. safely in case of overcurrent.

In protection cores, the composite error F_g is max. 5 % (5P) or 10 % (10P) in order to ensure the desired protection tripping.

The specified limits are only fulfilled at the rated burden of the transformer. If the operating burden differs from the rated burden of the transformer, the instrument security factor changes as follows:

$$n' = n \cdot \frac{Z_N + S_E}{S + S_E}$$

n' Actual instrument security factor
n Rated instrument security factor
Z_N Rated burden in VA
S_E Internal power consumption of the transformer in VA (approx. 5 % to 20 % of Z_N)
S Actually connected burden in VA

Operation and earthing

The secondary circuits of current transformers must never be open during operation, as dangerously high voltages can occur, especially at high currents and cores with high ratings.

All metal parts of a transformer that are not live, but accessible, must be earthed. Therefore, the transformers have earth connection points identified with the earthing symbol. Also, one terminal of the secondary winding (for current transformers, normally k or 1s, etc.) must be earthed.

For earthing the secondary windings, a thread is provided under each secondary terminal. The earth connection required is made by fitting a special screw.

Capacitively coupled voltage detecting system

The guidelines for every medium-voltage switchgear of the new generation state that doors and covers can only be opened when there is no risk of electric shock. The movable single-pole voltage testers used up to now are not suitable for this. Therefore, every medium-voltage switchgear is offered with a system including a fixed-mounted capacitive voltage divider.

The capacitive voltage detecting system consists of a capacitive divider which divides the voltage U between the phase L and earth into the partial voltages U_1 and U_2, and of an indicator applied to U_2. The indicator contains a glow lamp that flashes when voltage is applied.

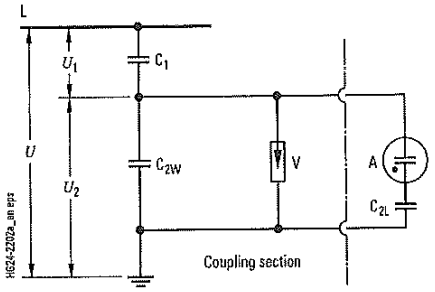
Indication range:
At 0.01 x U_N, no indication,
as of 0.40 x U_N, secure indication.

On request, support-type current transformers type 4MA7 can be delivered with capacitive layers for the voltage detecting system – then they contain a coupling electrode. This electrode is cast in a firm and protected way, and lead out at the secondary terminals with the designation CK. These current transformers are routine-tested additionally for compliance with the requested capacitance values (C_1 and C_{2W}). These values are documented on an additional label.

To ensure protection against electric shock even in the most improbable case that the current transformer punctures with the high-voltage capacitor (while an operator is touching the test sockets), a surge arrester is connected in parallel to this arrangement inside the transformer. If the high voltage is exceeded, it responds within nanoseconds, limiting the voltage at the test socket to harmless values.

Important for the ordering selection

When ordering transformers with capacitive layers it is necessary to state the actual operating voltage U_N (rated voltage), e.g. U_m = 24 kV, U_N = 15 kV.



Voltage detecting system

A Indicator
C_1 High-voltage capacitance (transformer)
C_{2W} Low-voltage capacitance (transformer)
C_{2L} Low-voltage capacitance (lead)
L High-voltage phase
U Voltage between phase and earth
U_1 Partial voltage at C_1
U_2 Partial voltage at C_2 and A
V Surge arrester

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Voltage transformers

Voltage transformers have only one magnet core, and are normally designed with one single secondary winding. If necessary, earthed (single-phase) voltage transformers are equipped with an additional residual voltage winding (earth-fault winding) beside the secondary winding (measuring winding).

In contrast to current transformers, voltage transformers must never be short-circuited on the secondary side. The earth-side terminal of the primary winding is effectively earthed in the terminal box, and must not be removed during operation.

Glossary of terms

Highest voltage for equipment U_m

The highest r.m.s. phase-to-phase voltage (in kV) for which a transformer is designed in respect of its insulation.

Rated voltage U_N

The voltage values (primary U_{PN} or secondary U_{SN}) stated on the rating plate of a transformer. If the voltage transformers are connected between phase and earth in three-phase systems, this phase-to-neutral voltage is considered the rated voltage. Except for the residual voltage winding, it is expressed as $U/\sqrt{3}$, with U being the phase-to-phase voltage.

U_m kV	Rated primary voltage kV	Rated secondary voltage V
up to 52	3.3 3.6 4.8 5 6 6.6 7.2 10 11 13.8 15 17.5 20 22 30 33 35 40 45	100 110 120
	or the values divided by $\sqrt{3}$	or the values divided by $\sqrt{3}$

Rated transformation ratio K_N

The ratio of the rated primary voltage to the rated secondary voltage. It is expressed as unreduced fraction, e.g.

$10000/\sqrt{3}$ V / $100/\sqrt{3}$ V (single-phase)
10000 V/100 V (double-phase).

Voltage error F_U

The voltage error expressed in percent is defined by the formula:

$$F_U = 100 \cdot \frac{K_N \cdot U_{sec} - U_{prim}}{U_{prim}}$$

U_{prim} Actual primary voltage
U_{sec} Actual secondary voltage under measuring conditions when U_{prim} is applied

Phase displacement

The difference in phase between the primary voltage and the secondary voltage vectors, the direction of the vectors being so chosen that the angle is zero for a perfect transformer. The phase displacement is said to be positive when the secondary voltage vector leads the primary voltage vector. It is usually expressed in minutes.

Limits for voltage error and phase displacement according to IEC 60044-1

The voltage error and phase displacement at rated frequency shall not exceed the values given in the table at any voltage between 80 % and 120 % of rated voltage and with burdens of between 25 % and 100 % of rated burden at a power factor of 0.8 lagging.

Accuracy class	± voltage error %	± phase displacement Minutes
0.2	0.2	10
0.5	0.5	20
1	1	40

Rated output S_N

The value of the apparent power (in VA at a specified power factor) which the transformer is intended to supply to the secondary circuit at the rated secondary voltage and with rated burden connected to it.

Preferred values:

Accuracy class	Rated output VA						
0.2	10	15	30	50	–	–	–
0.5	10	15	30	50	75	100	–
1	–	–	30	50	75	100	200

Thermal limiting output S_{th}

The value of the apparent power referred to rated voltage which can be taken from a secondary winding, at rated primary voltage applied, without exceeding the limits of temperature rise.

Thermal limiting output of the residual voltage winding

As the residual voltage winding is connected in broken delta, it is only stressed in case of fault. Therefore, the thermal limiting output of the residual voltage winding is referred to a stress duration of e.g. 8 h, and is expressed in VA.

Rated voltage factor

The multiplying factor to be applied to the rated primary voltage to determine the maximum voltage at which a transformer must comply with the relevant thermal requirements for a specified time and with the relevant accuracy requirements.

Multi-ratio

Voltage transformers for different rated primary voltages can only be reconnected on the secondary side for reasons of insulation.

Operation and earthing

In contrast to current transformers, voltage transformers must never be short-circuited on the secondary side. The earth-side primary terminal of earthed voltage transformers is insulated for a test voltage of 2 kV. It is connected to the earthed base plate in the terminal box.

Attention

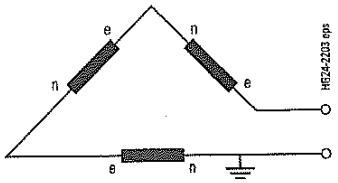
This connection must not be opened during operation.

Residual voltage windings connected in broken delta may only be earthed together at one point.

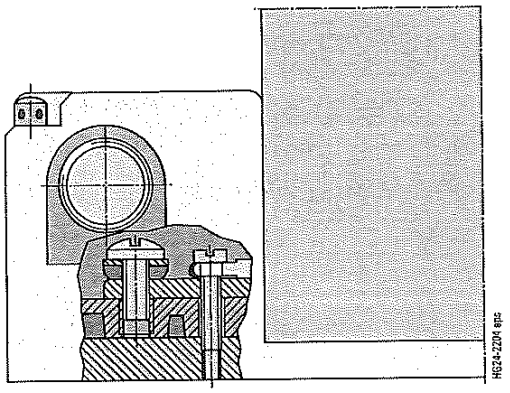
For earthing the secondary windings, a thread is provided under each secondary terminal. The earth connection required is established by fitting a special screw.

Relaxation oscillations

When single-phase voltage transformers are used in isolated systems, damping of the e–n windings connected in broken delta is recommended in order to avoid the possible destruction of the voltage transformers by relaxation oscillations.



Connection and earthing of the e–n or da–dn winding



Earthing of the secondary winding, for example, in a 4MR voltage transformer

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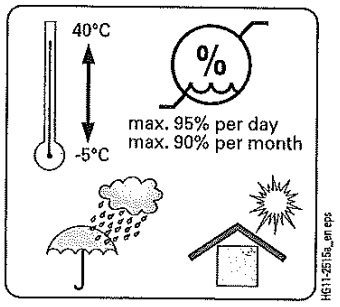

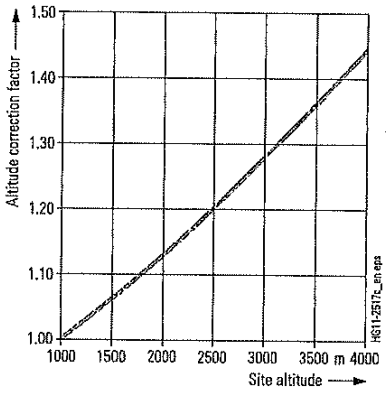

Highest voltage for equipment U_m	Rated short-duration power-frequency withstand voltage	Rated lightning impulse withstand voltage
kV	kV	V
7.2	20	60
12	28	75
17.5	38	95
24	50	125
36	70	170
52	95	250

Ambient conditions

The transformers are designed for the normal operating conditions defined in the standards.

The conditions shown opposite apply to indoor transformers. All indoor transformers are suitable for use with high air humidity and occasional condensation (e.g. in tropical areas).

As for outdoor transformers, the following conditions apply:

Minimum temperature

Outdoor transformers class 25	–25 °C
Outdoor transformers class 40	–40 °C

Relative air humidity

Outdoor transformers	up to 100 %

Dielectric strength

The dielectric strength of air insulation decreases with increasing altitude due to low air density. According to IEC 62271-1, the values of the rated lightning impulse withstand voltage and the rated short-duration power-frequency withstand voltage specified, among others, in the chapter "Technical Data" apply to a site altitude of 1000 m above sea level. For an altitude above 1000 m, the insulation level must be corrected according to the opposite diagram.

The characteristic shown applies to both rated withstand voltages.

To select the devices, the following applies:

$U \geq U_0 \times K_a$

U Rated withstand voltage under reference atmosphere
U_0 Rated withstand voltage requested for the place of installation
K_a Altitude correction factor according to the opposite diagram

Example

For a requested rated lightning impulse withstand voltage of 75 kV at an altitude of 2500 m, an insulation level of 90 kV under reference atmosphere is required as a minimum:

90 kV ≥ 75 kV x 1.2

Test voltages and insulation level for instrument transformers

Proper operation of the transformers is proved by the following tests:

- Impulse test (type test)
- Separate source withstand voltage test (routine test)
- Induced voltage withstand test (routine test)
- Partial discharge measurement (routine test)

All transformers correspond to insulation class E, i.e. the maximum temperature rise is 120 °C.

Partial discharge measurement

Apart from the tests mentioned on page 14, partial discharge measurements are required for current and voltage transformers to test the insulation. A partial discharge is to be understood as any small, brief electrical discharge appearing on or in a test object when voltage is applied. The discharges appear as soon as the partial discharge inception voltage of the insulating medium is exceeded at any point.

Relatively high field strengths appear at sharp edges and peaks of metal parts, or also on bubbles and gas inclusions in solid or liquid insulating materials.

Partial discharges act like HF emitters, producing a mixture of the most different frequencies. The partial discharge measurement enables an assessment about the homogeneity of the insulating material. Partial discharge measurements are performed as a routine test on inductive transformers with solid insulation as of U_m = 3.6 kV.

Type of earthing	Type of transformer	Pre-stressing voltage ≥ 10 s	Measuring voltage ≥ 1 min	Permissible partial discharge level Apparent load
Systems with isolated or impedance earthed neutral	Current transformers and earthed voltage transformers	1.3 U_m	1.1 U_m	250 pC
			$1.1\frac{U_m}{\sqrt{3}}$	50 pC
	Unearthed voltage transformers	1.3 U_m	1.1 U_m	50 pC
Systems with solidly earthed neutral	Current transformers and earthed voltage transformers	0.8 x 1.3 U_m	$1.1\frac{U_m}{\sqrt{3}}$	50 pC
	Unearthed voltage transformers	1.3 U_m	1.1 U_m	50 pC

Standards

Protective and measuring transformers conform to the following standards:

- VDE 0414 "Stipulations for instrument transformers"
- VDE 0111 "Insulation co-ordination for equipment in three-phase systems above 1 kV"
- IEC 60044-1
- IEC 60044-2
- ANSI 1675 (IEEE)
- DIN 42600

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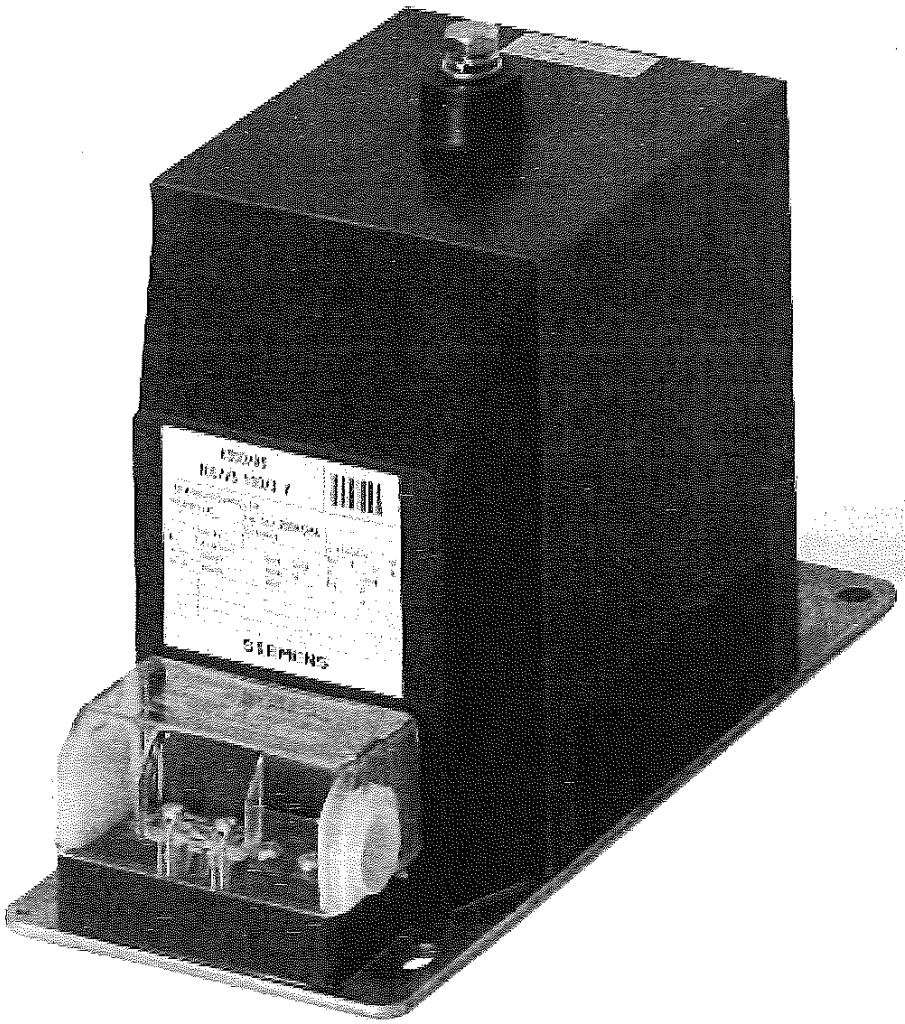

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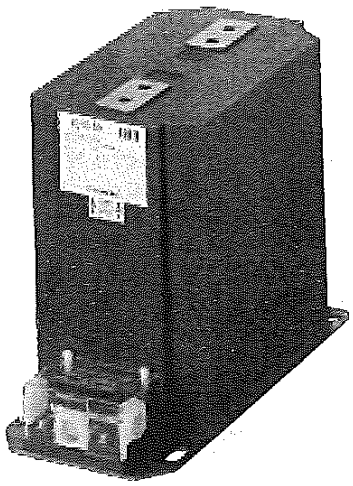
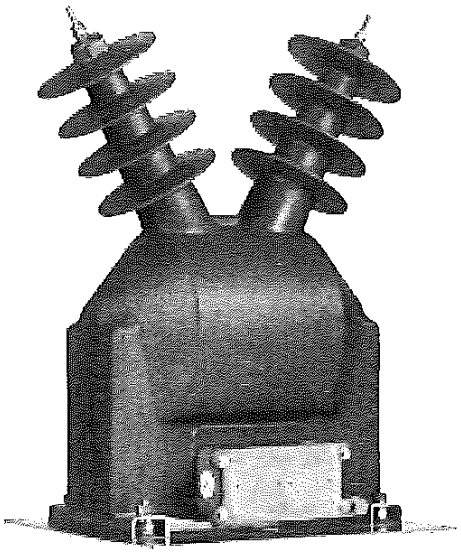


R-HG24-053.eps

4MA74 current transformer



R-HG24-058.eps

4MS6 outdoor voltage transformer

Contents | Page

2

ВЯРНО С ОРИГИНАЛА

000104

Order number structure

Protective and measuring transformers are described by a 12 or 16-digit order number. The first five characters describe the type, design and application of the transformer (primary part), and the positions 6 to 12 or 6 to 16 identify the core data of the transformer.

The transformers offered in the selection are only a part of the possible variations. If the transformer required is not shown, please clarify the feasibility with the responsible sales partner or the order processing department at the Switchgear Factory Berlin. The same applies to transformers according to the ANSI standard.

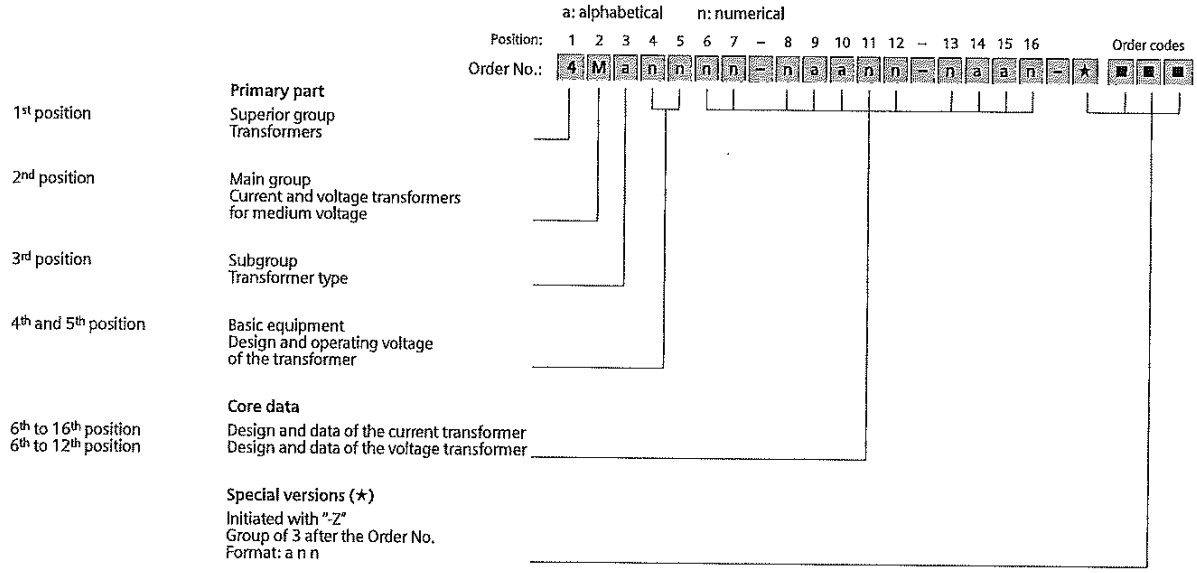
Order codes

Individual equipment versions, marked with **9** or **Z** in the 9th to 16th position, are explained more in detail by a 3-digit order code. Several order codes can be added to the order number in succession and in any sequence.

Built-on components and special versions (★)

For built-on components and special versions, "**-Z**" is added to the order number and a descriptive order code follows. If several built-on components and special versions are required, the suffix "**-Z**" is listed only once. If a requested special version is not in the catalog and can therefore not be ordered via order code, it has to be identified with **Y 9 9** after consultation. The agreement hereto is made directly between your responsible sales partner and the order processing department in the Switchgear Factory Berlin.

2



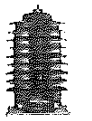
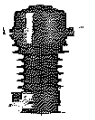
Configuration example

At the end of each of the following pages with selection data you will find a configuration example to make the order number structure more clear.
Starting from the last selection of the basic type, this example is continued, so that at the end of the equipment selection a completely configured and orderable transformer results for every product group.

On the foldout page we offer a configuring aid. Here you can fill in the order number you have determined for your transformer.

Example for Order No.: 4 M A 7 2 4 4 – ■ ■ ■ ■ ■ – ■ ■ ■ ■
Order codes:

Current transformer, type of construction according to IEC [1]

Illustration	Type of design	Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 / Order No.: 4 M ■ ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★	Order codes	
 R-HG24-056.eps	Indoor support-type current transformer, block-type design, small type according to DIN 42600, cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4 M A 7	Selection from page **20ff**	
 R-HG24-060.eps	Indoor support-type current transformer, single-turn design, cast-resin insulated, operating voltage up to 12 kV or 24 kV	4 M B 1	Selection from page **41ff**	
 R-HG24-061.eps	Indoor bushing-type current transformer, single-turn design, cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4 M C 2	Selection from page **44ff**	
 R-HG24-054.eps	Indoor bar-primary bushing-type current transformer, cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4 M C 3	Selection from page **47ff**	
 R-HG24-062.eps	Outdoor support-type current transformer, cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4 M E 2	Selection from page **53ff**	
 R-HG24-071.eps	Outdoor support-type current transformer, top-assembly type, operating voltage up to 12 kV, 24 kV, 36 kV and 52 kV	4 M E 3	Selection from page **58ff**	

1) Transformers according to ANSI standard on request

Example for Order No.: 4 M A 7 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■

Order codes:

000105

4MA7 indoor support-type current transformer, block-type design

5th position
Operating voltage (maximum value)

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes
Order No.: 4 M A 7 ■ ■ ■ – ■ ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

Operating voltage U_m kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV		
12	75	28	4 M A 7 2	
17.5	95	38	4 M A 7 2	– Z F 1 8
24	125	50	4 M A 7 4	
36	170	70	4 M A 7 6	

See page 21 See page 21 See page 22 to page 39 See page 40 See page 40 See page 40

6th/7th position
Rated short-time thermal current

Rated short-time thermal current I_{th} kA	Remark	
8		3 3
12.5		4 0
16		4 4
20		4 8
25		5 4
31.5		5 7
40		6 3
50	Not for U_m = 36 kV	6 7
63	Not for U_m = 24 kV and U_m = 36 kV	7 1

Configuration example
Indoor support-type current transformer, block-type design
Maximum operating voltage U_m = 12 kV
Rated lightning impulse withstand voltage U_p = 75 kV
Rated short-duration power-frequency withstand voltage U_d = 28 kV
Rated short-time thermal current I_{th} = 16 kA

4 M A 7 2 4 4

Example for Order No.: 4 M A 7 2 4 4 – ■ ■ ■ ■ ■ – ■ ■ ■ ■
Order codes:

Equipment Selection

4MA7 indoor support-type current transformer, block-type design

8th/9th position
Rated primary current

Rated primary current I_{PN} A	Rated primary current, with primary multi-ratio I_{PN} A	Rated short-time thermal current I_{th} 8 kA	12.5 kA	16 kA	20 kA	25 kA	31.5 kA	40 kA	50 kA	63 kA	8th/9th position
20		■	■	■							0 E
25		■	■	■	■						0 F
30		■	■	■	■						0 G
40		■	■	■	■	■	■				0 H
50		■	■	■	■	■	■	■			0 J
60		■	■	■	■	■	■	■	■		0 K
75		■	■	■	■	■	■	■	■	■	0 L
100		■	■	■	■	■	■	■	■	■	0 M
125		■	■	■	■	■	■	■	■	■	0 N
150		■	■	■	■	■	■	■	■	■	0 P
200		■	■	■	■	■	■	■	■	■	0 Q
250		■	■	■	■	■	■	■	■	■	0 R
300		■	■	■	■	■	■	■	■	■	0 S
400		■	■	■	■	■	■	■	■	■	0 T
500		■	■	■	■	■	■	■	■	■	0 U
600		■	■	■	■	■	■	■	■	■	0 V
750		■	■	■	■	■	■	■	■	■	0 W
800				■							0 X
1000		■	■	■	■	■	■	■	■	■	1 A
1200		■	■	■	■	■	■	■	■	■	1 B
1250		■	■	■	■	■	■	■	■	■	1 C
1500		■	■	■	■	■	■	■	■	■	1 D
2000		■	■	■	■	■	■	■	■	■	1 F
2500		■	■	■	■	■	■	■	■	■	1 G
	2x 20	■	■	■							3 E
	2x 25	■	■	■	■						3 F
	2x 30	■	■	■	■						3 G
	2x 40	■	■	■	■	■	■				3 H
	2x 50	■	■	■	■	■	■	■	■		3 J
	2x 60	■	■	■	■	■	■	■	■		3 K
	2x 75	■	■	■	■	■	■	■	■	■	3 L
	2x 100	■	■	■	■	■	■	■	■	■	3 M
	2x 125	■	■	■	■	■	■	■	■	■	3 N
	2x 150	■	■	■	■	■	■	■	■	■	3 P
	2x 200	■	■	■	■	■	■	■	■	■	3 Q
	2x 250	■	■	■	■	■	■	■	■	■	3 R
	2x 300	■	■	■	■	■	■	■	■	■	3 S
	2x 400	■	■	■	■	■	■	■	■	■	3 T
	2x 500	■	■	■	■	■	■	■	■	■	3 U
	2x 600	■	■	■	■	■	■	■	■	■	3 V
		Page 22	Page 24	Page 26	Page 28	Page 30	Page 32	Page 34	Page 36	Page 38	

■ Feasible (other combinations on request)

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 — Order codes

Order No.: 4 M A 7 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ■ ■ – ■ ■ ■

See page 22 to page 39 | See page 40 | See page 40 | See page 40

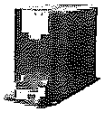
Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, U_p = 75 kV, U_d = 28 kV, I_{th} = 16 kA)
Rated primary current I_{PN} = 100 A

4 M A 7 2 4 4 – 0 M

Example for Order No.: 4 M A 7 2 4 4 – 0 M ■ ■ ■ – ■ ■ ■

Order codes:

000106



8 kA

10th to 14th position

Core versions

At rated primary current I_{PN}	Thermal strength	Position 10
100 A 125 A 150 A 200 A 250 A 300 A 400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
60 A 75 A	150 x I_{PN}	1
40 A 50 A	200 x I_{PN}	2
30 A	300 x I_{PN}	3
20 A 25 A	400 x I_{PN}	4

1st core			2nd core			Thermal strength										Position 11 12 13 14 15 16
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}		
0.2	FS10	10							■	■	■	■	■	■		C 2 – 0 A
		15							■	■	■	■	■	■		C 3 – 0 A
0.5	FS5	10							■	■	■	■	■	■		E 2 – 0 A
		15							■	■	■	■	■	■		E 3 – 0 A
		30							■	■	■	■	■	■		E 4 – 0 A
1	FS5	10							■	■	■	■	■	■		H 2 – 0 A
		15							■	■	■	■	■	■		H 3 – 0 A
		30							■	■	■	■	■	■		H 4 – 0 A
5P	10	5							■	■	■	■	■	■		L 1 – 0 A
		10							■	■	■	■	■	■		L 2 – 0 A
		15							■	■	■	■	■	■		L 3 – 0 A
		30									■	■	■	■		L 4 – 0 A
10P	10	5							■	■	■	■	■	■		Q 1 – 0 A
		10							■	■	■	■	■	■		Q 2 – 0 A
		15							■	■	■	■	■	■		Q 3 – 0 A
		30									■	■	■	■		Q 4 – 0 A
0.5	FS5	5	5P	10	5				■	■	■	■	■	■		E 1 – 1 L
		10			10				■	■	■	■	■	■		E 2 – 2 L
		15			15							■	■	■		E 3 – 3 L
		30			30							■	■	■		E 4 – 4 L
0.5	FS5	5	10P	10	5				■	■	■	■	■	■		E 1 – 1 Q
		10			10				■	■	■	■	■	■		E 2 – 2 Q
		15			15							■	■	■		E 3 – 3 Q
		30			30							■	■	■		E 4 – 4 Q
1	FS5	5	5P	10	5				■	■	■	■	■	■		H 1 – 1 L
		10			10				■	■	■	■	■	■		H 2 – 2 L
		10			15					■	■	■	■	■		H 2 – 3 L
		15			15					■	■	■	■	■		H 3 – 3 L
		15			30							■	■	■		H 3 – 4 L
		30			30							■	■	■		H 4 – 4 L
1	FS5	5	10P	10	5				■	■	■	■	■	■		H 1 – 1 Q
		10			10				■	■	■	■	■	■		H 2 – 2 Q
		10			15					■	■	■	■	■		H 2 – 3 Q
		15			15					■	■	■	■	■		H 3 – 3 Q
		15			30							■	■	■		H 3 – 4 Q
		30			30							■	■	■		H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 8 kA, I_{PN} = 100 A)
Thermal strength 100 x I_{PN}
1st core class 5P; instrument security factor 10; rating 30 VA
2nd core without

4 M A 7 2 3 3 – 0 M L 4 0 – 0 A

Example for Order No.: 4 M A 7 2 3 3 – 0 M L 4 0 – 0 A ■ ■
Order codes:

8 kA – with primary multi-ratio

10th to 14th position
Core versions

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 – Order codes
Order No.: 4 M A 7 ■ 3 3 – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

s. p. 40 s. p. 40 s. p. 40

At rated primary current I_{PN}	Thermal strength	Position 10
2x 100 A 2x 125 A 2x 150 A 2x 200 A 2x 250 A 2x 300 A 2x 400 A 2x 500 A 2x 600 A	100 x I_{PN}	0
2x 60 A 2x 75 A	150 x I_{PN}	1
2x 40 A 2x 50 A	200 x I_{PN}	2
2x 30 A	300 x I_{PN}	3
2x 20 A 2x 25 A	400 x I_{PN}	4

1st core Class	1st core Factor	1st core VA rating	2nd core Class	2nd core Factor	2nd core VA rating	Thermal strength 1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	Order No. positions 10 11 12 – 13 14
0.2	FS10	10								■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10								■	■	■	■	■	E 2 – 0 A
		15								■	■	■	■	■	E 3 – 0 A
		30								■	■	■	■	■	E 4 – 0 A
1	FS5	10								■	■	■	■	■	H 2 – 0 A
		15								■	■	■	■	■	H 3 – 0 A
		30								■	■	■	■	■	H 4 – 0 A
5P	10	5								■	■	■	■	■	L 1 – 0 A
		10								■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5								■	■	■	■	■	Q 1 – 0 A
		10								■	■	■	■	■	Q 2 – 0 A
		15								■	■	■	■	■	Q 3 – 0 A
		30									■	■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5					■	■	■	■	■	E 1 – 1 L
		10			10							■	■	■	E 2 – 2 L
		15			15							□	■	■	E 3 – 3 L
		30			30								■	■	E 4 – 4 L
0.5	FS5	5	10P	10	5					■	■	■	■	■	E 1 – 1 Q
		10			10							■	■	■	E 2 – 2 Q
		15			15								■	■	E 3 – 3 Q
		30			30								■	■	E 4 – 4 Q
1	FS5	5	5P	10	5					■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15						■	■	■	■	H 2 – 3 L
		15			15							■	■	■	H 3 – 3 L
		15			30							□	■	■	H 3 – 4 L
		30			30								■	■	H 4 – 4 L
1	FS5	5	10P	10	5					■	■	■	■	■	H 1 – 1 Q
		10			10					■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15							■	■	■	H 3 – 3 Q
		15			30							□	■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request) □ Not for 2x 40 A

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 8 kA, I_{PN} = 2x 100 A)
Thermal strength 100 x I_{PN}
1st core class 1; instrument security factor FS5; rating 15 VA
2nd core class 10P; accuracy limit factor 10; rating 30 VA

4 M A 7
2 3 3 – 3 M
0
H 3 – 4 Q

Example for Order No.: 4 M A 7 2 3 3 – 3 M H 3 0 – 4 Q ■ ■
Order codes:

000107

Equipment Selection

4MA7 indoor support-type current transformer, block-type design

2

12.5 kA

10th to 14th position
Core versions

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 – Order codes
Order No.: 4 M A 7 ■ 4 0 – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■
(positions 15, 16 and ★: s. p. 40)

At rated primary current I_{PN}	Thermal strength	Position 12
125 A 150 A 200 A 250 A 300 A 400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	$100 \times I_{PN}$	0
100 A	$150 \times I_{PN}$	1
75 A	$200 \times I_{PN}$	2
50 A 60 A	$300 \times I_{PN}$	3
40 A	$400 \times I_{PN}$	4
25 A 30 A	$500 \times I_{PN}$	5
20 A	$800 \times I_{PN}$	7

1st core			2nd core			Thermal strength									Order code
Class	Factor	VA rating	Class	Factor	VA rating	$1000 \times I_{PN}$	$800 \times I_{PN}$	$600 \times I_{PN}$	$500 \times I_{PN}$	$400 \times I_{PN}$	$300 \times I_{PN}$	$200 \times I_{PN}$	$150 \times I_{PN}$	$100 \times I_{PN}$	
0.2	FS10	10							■	■	■	■	■	■	C 2 – 0 A
		15							■	■	■	■	■	■	C 3 – 0 A
0.5	FS5	10					■		■	■	■	■	■	■	E 2 – 0 A
		15					■		■	■	■	■	■	■	E 3 – 0 A
		30							■	■	■	■	■	■	E 4 – 0 A
1	FS5	10					■		■	■	■	■	■	■	H 2 – 0 A
		15					■		■	■	■	■	■	■	H 3 – 0 A
		30							■	■	■	■	■	■	H 4 – 0 A
5P	10	5					■		■	■	■	■	■	■	L 1 – 0 A
		10							■	■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5					■		■	■	■	■	■	■	Q 1 – 0 A
		10					■		■	■	■	■	■	■	Q 2 – 0 A
		15							■	■	■	■	■	■	Q 3 – 0 A
		30									■	■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E 1 – 1 L
		10			10				■	■	■	■	■	■	E 2 – 2 L
		15			15							■	■	■	E 3 – 3 L
		30			30								■	■	E 4 – 4 L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E 1 – 1 Q
		10			10				■	■	■	■	■	■	E 2 – 2 Q
		15			15						■	■	■	■	E 3 – 3 Q
		30			30								■	■	E 4 – 4 Q
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H 1 – 1 L
		10			10				■	■	■	■	■	■	H 2 – 2 L
		10			15					■	■	■	■	■	H 2 – 3 L
		15			15					■	■	■	■	■	H 3 – 3 L
		15			30							■	■	■	H 3 – 4 L
		30			30								■	■	H 4 – 4 L
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H 1 – 1 Q
		10			10				■	■	■	■	■	■	H 2 – 2 Q
		10			15					■	■	■	■	■	H 2 – 3 Q
		15			15					■	■	■	■	■	H 3 – 3 Q
		15			30						■	■	■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design — 4 M A 7
(U_m = 12 kV, I_{th} = 12.5 kA, I_{PN} = 100 A) — 2 4 0 – 0 M
Thermal strength $150 \times I_{PN}$ — 1
1st core class 10P; instrument security factor 10; rating 5 VA
2nd core without — Q 1 – 0 A

Example for Order No.: 4 M A 7 2 4 0 – 0 M Q 1 1 – 0 A ■ ■
Order codes:

12.5 kA – with primary multi-ratio

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength	Position: 10	Order No.:
2x 125 A 2x 150 A 2x 200 A 2x 250 A 2x 300 A 2x 400 A 2x 500 A 2x 600 A	100 x I_{PN}	0	
2x 100 A	150 x I_{PN}	1	
2x 75 A	200 x I_{PN}	2	
2x 50 A 2x 60 A	300 x I_{PN}	3	
2x 40 A	400 x I_{PN}	4	
2x 25 A 2x 30 A	500 x I_{PN}	5	
2x 20 A	800 x I_{PN}	7	

1st core			2nd core			Thermal strength							
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}
0.2	FS10	10								■	■	■	■	■
		15								■	■	■	■	■
0.5	FS5	10					■		■	■	■	■	■	■
		15							■	■	■	■	■	■
		30								■	■	■	■	■
1	FS5	10					■		■	■	■	■	■	■
		15					■		■	■	■	■	■	■
		30							■	■	■	■	■	■
5P	10	5					■		■	■	■	■	■	■
		10							■	■	■	■	■	■
		15								■	■	■	■	■
		30										■	■	■
10P	10	5					■		■	■	■	■	■	■
		10					■		■	■	■	■	■	■
		15							■	■	■	■	■	■
		30										■	■	■
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■
		10			10					■	■	■	■	■
		15			15							■	■	■
		30			30								■	■
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■
		10			10					■	■	■	■	■
		15			15							■	■	■
		30			30								■	■
1	FS5	5	5P	10	5		■		■	■	■	■	■	■
		10			10				■	■	■	■	■	■
		10			15					■	■	■	■	■
		15			15					■	■	■	■	■
		15			30							■	■	■
		30			30								■	■
1	FS5	5	10P	10	5		■		■	■	■	■	■	■
		10			10				■	■	■	■	■	■
		10			15					■	■	■	■	■
		15			15					■	■	■	■	■
		15			30							■	■	■
		30			30								■	■

■ Feasible (other combinations on request)

Position: 11	12	–	13	14	15	16		Order codes
					s. p. 40	s. p. 40	s. p. 40	
C	2	–	0	A				
C	3	–	0	A				
E	2	–	0	A				
E	3	–	0	A				
E	4	–	0	A				
H	2	–	0	A				
H	3	–	0	A				
H	4	–	0	A				
L	1	–	0	A				
L	2	–	0	A				
L	3	–	0	A				
L	4	–	0	A				
Q	1	–	0	A				
Q	2	–	0	A				
Q	3	–	0	A				
Q	4	–	0	A				
E	1	–	1	L				
E	2	–	2	L				
E	3	–	3	L				
E	4	–	4	L				
E	1	–	1	Q				
E	2	–	2	Q				
E	3	–	3	Q				
E	4	–	4	Q				
H	1	–	1	L				
H	2	–	2	L				
H	2	–	3	L				
H	3	–	3	L				
H	3	–	4	L				
H	4	–	4	L				
H	1	–	1	Q				
H	2	–	2	Q				
H	2	–	3	Q				
H	3	–	3	Q				
H	3	–	4	Q				
H	4	–	4	Q				

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 12.5 kA, I_{PN} = 2x 100 A)
Thermal strength 150 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 15 VA
2nd core class 10P; accuracy limit factor 10; rating 15 VA

	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes
																	s. p. 40	s. p. 40	s. p. 40	
Example for Order No.:	4	M	A	7	2	4	0	–	3	M	E	3	1	–	3	Q	■	■		
Order codes:	4	M	A	7	2	4	0	–	3	M	E	3	1	–	3	Q				

000108

16 kA

10th to 14th position

Core versions

At rated primary current I_{PN}	Thermal strength
200 A 250 A 300 A 400 A 500 A 600 A 750 A 800 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}
125 A 150 A	150 x I_{PN}
100 A	200 x I_{PN}
60 A 75 A	300 x I_{PN}
40 A 50 A	400 x I_{PN}
30 A	600 x I_{PN}
25 A	800 x I_{PN}
20 A	1000 x I_{PN}

1st core			2nd core			Thermal strength								
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}
0.2	FS10	10								■	■	■	■	■
		15								■	■	■	■	■
0.5	FS5	10						■	■	■	■	■	■	■
		15							■	■	■	■	■	■
		30								■	■	■	■	■
1	FS5	10						■	■	■	■	■	■	■
		15						■	■	■	■	■	■	■
		30							■	■	■	■	■	■
5P	10	5						■	■	■	■	■	■	■
		10							■	■	■	■	■	■
		15								■	■	■	■	■
		30									■	■	■	■
10P	10	5						■	■	■	■	■	■	■
		10						■	■	■	■	■	■	■
		15							■	■	■	■	■	■
		30									■	■	■	■
0.5	FS5	5	5P	10	5		■	■	■	■	■	■	■	■
		10			10			■	■	■	■	■	■	■
		15			15						■	■	■	■
		30			30							■	■	■
0.5	FS5	5	10P	10	5		■	■	■	■	■	■	■	■
		10			10					■	■	■	■	■
		15			15						■	■	■	■
		30			30							■	■	■
1	FS5	5	5P	10	5	■	■	■	■	■	■	■	■	■
		10			10					■	■	■	■	■
		10			15						■	■	■	■
		15			15						■	■	■	■
		15			30							■	■	■
		30			30							■	■	■
1	FS5	5	10P	10	5	■	■	■	■	■	■	■	■	■
		10			10					■	■	■	■	■
		10			15						■	■	■	■
		15			15						■	■	■	■
		15			30							■	■	■
		30			30							■	■	■

■ Feasible (other combinations on request)

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes
Order No.:	4	M	A	7	■	4	4	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■
																	s. p. 40	s. p. 40		s. p. 40	
													0								
													1								
													2								
													3								
													4								
													6								
													7								
													8								
											C	2		–	0	A				
											C	3		–	0	A				
											E	2		–	0	A				
											E	3		–	0	A				
											E	4		–	0	A				
											H	2		–	0	A				
											H	3		–	0	A				
											H	4		–	0	A				
											L	1		–	0	A				
											L	2		–	0	A				
											L	3		–	0	A				
											L	4		–	0	A				
											Q	1		–	0	A				
											Q	2		–	0	A				
											Q	3		–	0	A				
											Q	4		–	0	A				
											E	1		–	1	L				
											E	2		–	2	L				
											E	3		–	3	L				
											E	4		–	4	L				
											E	1		–	1	Q				
											E	2		–	2	Q				
											E	3		–	3	Q				
											E	4		–	4	Q				
											H	1		–	1	L				
											H	2		–	2	L				
											H	2		–	3	L				
											H	3		–	3	L				
											H	3		–	4	L				
											H	4		–	4	L				
											H	1		–	1	Q				
											H	2		–	2	Q				
											H	2		–	3	Q				
											H	3		–	3	Q				
											H	3		–	4	Q				
											H	4		–	4	Q				

Configuration example

Indoor support-type current transformer, block-type design
(U_n = 12 kV, I_{th} = 16 kA, I_{PN} = 100 A)
Thermal strength 200 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 10 VA
2nd core class 5P; accuracy limit factor 10; rating 10 VA

	4	M	A	7	2	4	4	–	0	M	E	2	2	–	2	L	■	■
Example for Order No.:																					
Order codes:																					

16 kA – with primary multi-ratio

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength
2x 200 A 2x 250 A 2x 300 A 2x 400 A 2x 500 A 2x 600 A	100 x I_{PN}
2x 125 A 2x 150 A	150 x I_{PN}
2x 100 A	200 x I_{PN}
2x 60 A 2x 75 A	300 x I_{PN}
2x 40 A 2x 50 A	400 x I_{PN}
2x 30 A	600 x I_{PN}
2x 25 A	800 x I_{PN}
2x 20 A	1000 x I_{PN}

1st core			2nd core			Thermal strength								
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}
0.2	FS10	10								■	■	■	■	■
		15								■	■	■	■	■
0.5	FS5	10				■	■	■		■	■	■	■	■
		15						■		■	■	■	■	■
		30								■	■	■	■	■
1	FS5	10				■	■	■		■	■	■	■	■
		15				■	■	■		■	■	■	■	■
		30								■	■	■	■	■
5P	10	5				■	■	■		■	■	■	■	■
		10						■		■	■	■	■	■
		15								■	■	■	■	■
		30										■	■	■
10P	10	5				■	■	■		■	■	■	■	■
		10				■	■	■		■	■	■	■	■
		15						■		■	■	■	■	■
		30										■	■	■
0.5	FS5	5	5P	10	5			■		■	■	■	■	■
		10			10						■	■	■	■
		15			15							■	■	■
		30			30								■	■
0.5	FS5	5	10P	10	5			■		■	■	■	■	■
		10			10						■	■	■	■
		15			15							■	■	■
		30			30								■	■
1	FS5	5	5P	10	5	■	■	■		■	■	■	■	■
		10			10					■	■	■	■	■
		10			15						■	■	■	■
		15			15						■	■	■	■
		15			30							■	■	■
		30			30								■	■
1	FS5	5	10P	10	5	■	■	■		■	■	■	■	■
		10			10					■	■	■	■	■
		10			15						■	■	■	■
		15			15						■	■	■	■
		15			30							■	■	■
		30			30								■	■

■ Feasible (other combinations on request)

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes

Order No.: 4 M A 7 ■ 4 4 – ■ ■ ■ ■ ■ – ■ ■ ■ – ★ ■ ■ ■

s. p. 40 s. p. 40 s. p. 40

10	11	12				
		0				
		1				
		2				
		3				
		4				
		6				
		7				
		8				
C	2		–	0	A	
C	3		–	0	A	
E	2		–	0	A	
E	3		–	0	A	
E	4		–	0	A	
H	2		–	0	A	
H	3		–	0	A	
H	4		–	0	A	
L	1		–	0	A	
L	2		–	0	A	
L	3		–	0	A	
L	4		–	0	A	
Q	1		–	0	A	
Q	2		–	0	A	
Q	3		–	0	A	
Q	4		–	0	A	
E	1		–	1	L	
E	2		–	2	L	
E	3		–	3	L	
E	4		–	4	L	
E	1		–	1	Q	
E	2		–	2	Q	
E	3		–	3	Q	
E	4		–	4	Q	
H	1		–	1	L	
H	2		–	2	L	
H	2		–	3	L	
H	3		–	3	L	
H	3		–	4	L	
H	4		–	4	L	
H	1		–	1	Q	
H	2		–	2	Q	
H	2		–	3	Q	
H	3		–	3	Q	
H	3		–	4	Q	
H	4		–	4	Q	

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 16 kA, I_{PN} = 2x 100 A)
Thermal strength 200 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 10 VA
2nd core without

4 M A 7 2 4 4 – 3 M E 2 2 – 0 A ■ ■

Example for Order No.: 4 M A 7 2 4 4 – 3 M E 2 2 – 0 A ■ ■
Order codes:

000109

20 kA

10th to 14th position

Core versions

At rated primary current I_{PN}	Thermal strength	Position 10 11 12
200 A 250 A 300 A 400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
150 A	150 x I_{PN}	1
100 A 125 A	200 x I_{PN}	2
75 A	300 x I_{PN}	3
50 A 60 A	400 x I_{PN}	4
40 A	500 x I_{PN}	5
30 A	800 x I_{PN}	7
25 A	1000 x I_{PN}	8

1st core			2nd core			Thermal strength								Position 13 14 15 16			
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}				
0.2	FS10	10					■		■	■	■	■	■	■	C	2	–	0 A
		15							■	■	■	■	■	■	C	3	–	0 A
0.5	FS5	10				■	■		■	■	■	■	■	■	E	2	–	0 A
		15					■		■	■	■	■	■	■	E	3	–	0 A
		30							■	■	■	■	■	■	E	4	–	0 A
1	FS5	10				■	■		■	■	■	■	■	■	H	2	–	0 A
		15				■	■		■	■	■	■	■	■	H	3	–	0 A
		30							■	■	■	■	■	■	H	4	–	0 A
5P	10	5				■	■		■	■	■	■	■	■	L	1	–	0 A
		10							■	■	■	■	■	■	L	2	–	0 A
		15								■	■	■	■	■	L	3	–	0 A
		30										■	■	■	L	4	–	0 A
10P	10	5				■	■		■	■	■	■	■	■	Q	1	–	0 A
		10				■	■			■	■	■	■	■	Q	2	–	0 A
		15							■	■	■	■	■	■	Q	3	–	0 A
		30									■	■	■	■	Q	4	–	0 A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E	1	–	1 L
		10			10					■	■	■	■	■	E	2	–	2 L
		15			15							■	■	■	E	3	–	3 L
		30			30									■	E	4	–	4 L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E	1	–	1 Q
		10			10					■	■	■	■	■	E	2	–	2 Q
		15			15							■	■	■	E	3	–	3 Q
		30			30									■	E	4	–	4 Q
1	FS5	5	5P	10	5	■	■		■	■	■	■	■	■	H	1	–	1 L
		10			10					■	■	■	■	■	H	2	–	2 L
		10			15						■	■	■	■	H	2	–	3 L
		15			15						■	■	■	■	H	3	–	3 L
		15			30								■	■	H	3	–	4 L
		30			30									■	H	4	–	4 L
1	FS5	5	10P	10	5	■	■		■	■	■	■	■	■	H	1	–	1 Q
		10			10				■	■	■	■	■	■	H	2	–	2 Q
		10			15						■	■	■	■	H	2	–	3 Q
		15			15						■	■	■	■	H	3	–	3 Q
		15			30								■	■	H	3	–	4 Q
		30			30									■	H	4	–	4 Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 20 kA, I_{PN} = 100 A)
Thermal strength 200 x I_{PN}
1st core class 1; instrument security factor FS5; rating 10 VA
2nd core class 5P; accuracy limit factor 10; rating 15 VA

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes
Order No.:	4	M	A	7	■	4	8	–	■	■	■	■	■	–	■	■	■	■	–	■ ■ ■
																	s. p. 40	s. p. 40	s. p. 40	
Example for Order No.:	4	M	A	7	2	4	8	–	0	M	H	2	2	–	3	L				
Order codes:																				

20 kA – with primary multi-ratio

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength	Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16	Order codes
		Order No.: 4 M A 7 ■ 4 8 – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★	■ ■ ■
			s. p. 40 s. p. 40 s. p. 40
2x 200 A 2x 250 A 2x 300 A 2x 400 A 2x 500 A 2x 600 A	100 x I_{PN}		0
2x 150 A	150 x I_{PN}		1
2x 100 A 2x 125 A	200 x I_{PN}		2
2x 75 A	300 x I_{PN}		3
2x 50 A 2x 60 A	400 x I_{PN}		4
2x 40 A	500 x I_{PN}		5
2x 30 A	800 x I_{PN}		7
2x 25 A	1000 x I_{PN}		8

1st core			2nd core			Thermal strength									
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	
0.2	FS10	10								■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10				■	■		■	■	■	■	■	■	E 2 – 0 A
		15							■	■	■	■	■	■	E 3 – 0 A
		30								■	■	■	■	■	E 4 – 0 A
1	FS5	10				■	■		■	■	■	■	■	■	H 2 – 0 A
		15				■	■		■	■	■	■	■	■	H 3 – 0 A
		30							■	■	■	■	■	■	H 4 – 0 A
5P	10	5				■	■		■	■	■	■	■	■	L 1 – 0 A
		10							■	■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5				■	■		■	■	■	■	■	■	Q 1 – 0 A
		10					■		■	■	■	■	■	■	Q 2 – 0 A
		15							■	■	■	■	■	■	Q 3 – 0 A
		30										■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5				■	■	■	■	■	■	E 1 – 1 L
		10			10							■	■	■	E 2 – 2 L
		15			15							■	■	■	E 3 – 3 L
		30			30								■	■	E 4 – 4 L
0.5	FS5	5	10P	10	5				■	■	■	■	■	■	E 1 – 1 Q
		10			10				■		■	■	■	■	E 2 – 2 Q
		15			15							■	■	■	E 3 – 3 Q
		30			30								■	■	E 4 – 4 Q
1	FS5	5	5P	10	5	■	■		■	■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15						■	■	■	■	H 2 – 3 L
		15			15						■	■	■	■	H 3 – 3 L
		15			30								■	■	H 3 – 4 L
		30			30								■	■	H 4 – 4 L
1	FS5	5	10P	10	5	■	■		■	■	■	■	■	■	H 1 – 1 Q
		10			10					■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15						■	■	■	■	H 3 – 3 Q
		15			30								■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 20 kA, I_{PN} = 2x 100 A)
Thermal strength 200 x I_{PN}
1st core class 1; instrument security factor FS5; rating 5 VA
2nd core class 10P; accuracy limit factor 10; rating 5 VA

Example for Order No.: 4 M A 7 2 4 8 – 3 M H 1 2 – 1 Q ■ ■
Order codes:

000110

Equipment Selection

4MA7 indoor support-type current transformer, block-type design

2

25 kA

10th to 14th position
Core versions

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 – Order codes
Order No.: 4 M A 7 ■ 5 4 – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

(Positions 15, 16 and ★: s. p. 40)

At rated primary current I_{PN}	Thermal strength	Position 12
250 A 300 A 400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
200 A	150 x I_{PN}	1
125 A 150 A	200 x I_{PN}	2
100 A	300 x I_{PN}	3
75 A	400 x I_{PN}	4
50 A 60 A	500 x I_{PN}	5
40 A	800 x I_{PN}	7

1st core Class	1st core Factor	1st core VA rating	2nd core Class	2nd core Factor	2nd core VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	Position 10 11 12 – 13 14
0.2	FS10	10							■	■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10					■		■	■	■	■	■	■	E 2 – 0 A
		15							■	■	■	■	■	■	E 3 – 0 A
		30							■	■	■	■	■	■	E 4 – 0 A
1	FS5	10					■		■	■	■	■	■	■	H 2 – 0 A
		15					■		■	■	■	■	■	■	H 3 – 0 A
		30							■	■	■	■	■	■	H 4 – 0 A
5P	10	5					■		■	■	■	■	■	■	L 1 – 0 A
		10							■	■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5					■		■	■	■	■	■	■	Q 1 – 0 A
		10					■		■	■	■	■	■	■	Q 2 – 0 A
		15							■	■	■	■	■	■	Q 3 – 0 A
		30									■	■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E 1 – 1 L
		10			10					■	■	■	■	■	E 2 – 2 L
		15			15							■	■	■	E 3 – 3 L
		30			30									■	E 4 – 4 L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E 1 – 1 Q
		10			10					■	■	■	■	■	E 2 – 2 Q
		15			15							■	■	■	E 3 – 3 Q
		30			30									■	E 4 – 4 Q
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15						■	■	■	■	H 2 – 3 L
		15			15						■	■	■	■	H 3 – 3 L
		15			30								■	■	H 3 – 4 L
		30			30									■	H 4 – 4 L
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H 1 – 1 Q
		10			10				■	■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15						■	■	■	■	H 3 – 3 Q
		15			30							■	■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design — 4 M A 7
(U_m = 12 kV, I_{th} = 25 kA, I_{PN} = 100 A) — 2 5 4 – 0 M
Thermal strength 300 x I_{PN} — 3
1st core class 10P; instrument security factor 10; rating 15 VA
2nd core without — Q 3 – 0 A

Example for Order No.: 4 M A 7 2 5 4 – 0 M Q 3 3 – 0 A ■ ■
Order codes:

25 kA – with primary multi-ratio

10th to 14th position
Core versions

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 – Order codes
Order No.: 4 M A 7 ■ 5 4 – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■
s.p. 40 s.p. 40 s.p. 40

At rated primary current I_{PN}	Thermal strength	Position 12
2x 250 A 2x 300 A 2x 400 A 2x 500 A 2x 600 A	$100 \times I_{PN}$	0
2x 200 A	$150 \times I_{PN}$	1
2x 125 A 2x 150 A	$200 \times I_{PN}$	2
2x 100 A	$300 \times I_{PN}$	3
2x 75 A	$400 \times I_{PN}$	4
2x 50 A 2x 60 A	$500 \times I_{PN}$	5
2x 40 A	$800 \times I_{PN}$	7

1st core Class	1st core Factor	1st core VA rating	2nd core Class	2nd core Factor	2nd core VA rating	Thermal strength $1000 \times I_{PN}$	$800 \times I_{PN}$	$600 \times I_{PN}$	$500 \times I_{PN}$	$400 \times I_{PN}$	$300 \times I_{PN}$	$200 \times I_{PN}$	$150 \times I_{PN}$	$100 \times I_{PN}$	Positions 10 11 – 13 14
0.2	FS10	10							■	■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10					■		■	■	■	■	■	■	E 2 – 0 A
		15							■	■	■	■	■	■	E 3 – 0 A
		30							■	■	■	■	■	■	E 4 – 0 A
1	FS5	10					■		■	■	■	■	■	■	H 2 – 0 A
		15					■		■	■	■	■	■	■	H 3 – 0 A
		30							■	■	■	■	■	■	H 4 – 0 A
5P	10	5					■		■	■	■	■	■	■	L 1 – 0 A
		10							■	■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5					■		■	■	■	■	■	■	Q 1 – 0 A
		10							■	■	■	■	■	■	Q 2 – 0 A
		15							■	■	■	■	■	■	Q 3 – 0 A
		30										■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5				■	■	■	■	■	■	E 1 – 1 L
		10			10						■	■	■	■	E 2 – 2 L
		15			15							■	■	■	E 3 – 3 L
		30			30								■	■	E 4 – 4 L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E 1 – 1 Q
		10			10					■	■	■	■	■	E 2 – 2 Q
		15			15							■	■	■	E 3 – 3 Q
		30			30								■	■	E 4 – 4 Q
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15						■	■	■	■	H 2 – 3 L
		15			15						■	■	■	■	H 3 – 3 L
		15			30								■	■	H 3 – 4 L
		30			30								■	■	H 4 – 4 L
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H 1 – 1 Q
		10			10				■	■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15						■	■	■	■	H 3 – 3 Q
		15			30								■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 25 kA, I_{PN} = 2x 100 A)
Thermal strength $300 \times I_{PN}$
1st core class 10P; instrument security factor 10; rating 15 VA
2nd core without

4 M A 7
2 5 4 – 3 M
3
Q 3 – 0 A

Example for Order No.: 4 M A 7 2 5 4 – 3 M Q 3 3 – 0 A ■ ■
Order codes:

2

000111

Equipment Selection

4MA7 indoor support-type current transformer, block-type design

31.5 kA

10th to 14th position

Core versions

At rated primary current I_{PN}	Thermal strength	Position 12
400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
250 A 300 A	150 x I_{PN}	1
200 A	200 x I_{PN}	2
125 A 150 A	300 x I_{PN}	3
100 A	400 x I_{PN}	4
75 A	500 x I_{PN}	5
60 A	600 x I_{PN}	6
50 A	800 x I_{PN}	7
40 A	1000 x I_{PN}	8

1st core Class	1st core Factor	1st core VA rating	2nd core Class	2nd core Factor	2nd core VA rating	Thermal strength 1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	Position 10	11	12	13	14	15	16
0.2	FS10	10							■	■	■	■	■	■	C	2	–	0	A		
		15							■	■	■	■	■	■	C	3	–	0	A		
0.5	FS5	10				■	■	■	■	■	■	■	■	■	E	2	–	0	A		
		15					■	■	■	■	■	■	■	■	E	3	–	0	A		
		30							■	■	■	■	■	■	E	4	–	0	A		
1	FS5	10				■	■	■	■	■	■	■	■	■	H	2	–	0	A		
		15					■	■	■	■	■	■	■	■	H	3	–	0	A		
		30							■	■	■	■	■	■	H	4	–	0	A		
5P	10	5				■	■	■	■	■	■	■	■	■	L	1	–	0	A		
		10							■	■	■	■	■	■	L	2	–	0	A		
		15							■	■	■	■	■	■	L	3	–	0	A		
		30								■	■	■	■	■	L	4	–	0	A		
10P	10	5				■	■	■	■	■	■	■	■	■	Q	1	–	0	A		
		10				■	■	■	■	■	■	■	■	■	Q	2	–	0	A		
		15							■	■	■	■	■	■	Q	3	–	0	A		
		30								■	■	■	■	■	Q	4	–	0	A		
0.5	FS5	5	5P	10	5		■	■	■	■	■	■	■	■	E	1	–	1	L		
		10			10				■	■	■	■	■	■	E	2	–	2	L		
		15			15					■	■	■	■	■	E	3	–	3	L		
		30			30									■	E	4	–	4	L		
0.5	FS5	5	10P	10	5		■	■	■	■	■	■	■	■	E	1	–	1	Q		
		10			10				■	■	■	■	■	■	E	2	–	2	Q		
		15			15					■	■	■	■	■	E	3	–	3	Q		
		30			30									■	E	4	–	4	Q		
1	FS5	5	5P	10	5	■	■	■	■	■	■	■	■	■	H	1	–	1	L		
		10			10				■	■	■	■	■	■	H	2	–	2	L		
		10			15					■	■	■	■	■	H	2	–	3	L		
		15			15					■	■	■	■	■	H	3	–	3	L		
		15			30									■	H	3	–	4	L		
		30			30									■	H	4	–	4	L		
1	FS5	5	10P	10	5	■	■	■	■	■	■	■	■	■	H	1	–	1	Q		
		10			10				■	■	■	■	■	■	H	2	–	2	Q		
		10			15					■	■	■	■	■	H	2	–	3	Q		
		15			15					■	■	■	■	■	H	3	–	3	Q		
		15			30									■	H	3	–	4	Q		
		30			30									■	H	4	–	4	Q		

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 31.5 kA, I_{PN} = 100 A)
Thermal strength 400 x I_{PN}
1st core class 0.2; instrument security factor FS10; rating 15 VA
2nd core without

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes
Order No.:	4	M	A	7	■	5	7	–	■	■	■	■	■	–	■	■	■	■	–	■ ■
	4	M	A	7	2	5	7	–	0	M	C	3	4	–	0	A				

s. p. 40 s. p. 40 s. p. 40 ★

Example for Order No.: 4MA7257–0MC34–0A ■ ■
Order codes:

31.5 kA – with primary multi-ratio

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength	Position: 10	11	12
		Order No.: ■	■	■
2x 300 A 2x 400 A 2x 500 A 2x 600 A	100 x I_{PN}			0
250 A 300 A	150 x I_{PN}			1
200 A	200 x I_{PN}			2
125 A 150 A	300 x I_{PN}			3
100 A	400 x I_{PN}			4
75 A	500 x I_{PN}			5
60 A	600 x I_{PN}			6
50 A	800 x I_{PN}			7
40 A	1000 x I_{PN}			8

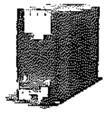
1st core			2nd core			Thermal strength									10	11	12
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}			
0.2	FS10	10						■	■	■	■	■	■	■	C	2	
		15						■	■	■	■	■	■	■	C	3	
0.5	FS5	10				■	■	■	■	■	■	■	■	■	E	2	
		15					■	■	■	■	■	■	■	■	E	3	
		30						■	■	■	■	■	■	■	E	4	
1	FS5	10				■	■	■	■	■	■	■	■	■	H	2	
		15				■	■	■	■	■	■	■	■	■	H	3	
		30						■	■	■	■	■	■	■	H	4	
5P	10	5				■	■	■	■	■	■	■	■	■	L	1	
		10						■	■	■	■	■	■	■	L	2	
		15							■	■	■	■	■	■	L	3	
		30									■	■	■	■	L	4	
10P	10	5				■	■	■	■	■	■	■	■	■	Q	1	
		10					■	■	■	■	■	■	■	■	Q	2	
		15						■	■	■	■	■	■	■	Q	3	
		30									■	■	■	■	Q	4	
0.5	FS5	5	5P	10	5		■	■	■	■	■	■	■	■	E	1	
		10			10					■	■	■	■	■	E	2	
		15			15						■	■	■	■	E	3	
		30			30						■	■	■	■	E	4	
0.5	FS5	5	10P	10	5		■	■	■	■	■	■	■	■	E	1	
		10			10					■	■	■	■	■	E	2	
		15			15						■	■	■	■	E	3	
		30			30							■	■	■	E	4	
1	FS5	5	5P	10	5	■	■	■	■	■	■	■	■	■	H	1	
		10			10					■	■	■	■	■	H	2	
		10			15						■	■	■	■	H	2	
		15			15						■	■	■	■	H	3	
		15			30							■	■	■	H	3	
		30			30							■	■	■	H	4	
1	FS5	5	10P	10	5	■	■	■	■	■	■	■	■	■	H	1	
		10			10					■	■	■	■	■	H	2	
		10			15						■	■	■	■	H	2	
		15			15						■	■	■	■	H	3	
		15			30							■	■	■	H	3	
		30			30							■	■	■	H	4	

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 31.5 kA, I_{PN} = 2x 100 A)
Thermal strength 400 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 5 VA
2nd core class 10P; accuracy limit factor 10; rating 5 VA

	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes
																	s. p. 40	s. p. 40	s. p. 40	
Example for Order No.:	4	M	A	7	2	5	7	–	3	M	E	1	4	–	1	Q	■	■		
Order codes:	4	M	A	7																

000112



2

40 kA

10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes
Order No.:	4	M	A	7	■	6	3	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
																s. p. 40	s. p. 40	s. p. 40		s. p. 40	

At rated primary current I_{PN}	Thermal strength	Position 12
400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
300 A	150 x I_{PN}	1
200 A 250 A	200 x I_{PN}	2
150 A	300 x I_{PN}	3
100 A 125 A	400 x I_{PN}	4
75 A	600 x I_{PN}	6
60 A	800 x I_{PN}	7
50 A	1000 x I_{PN}	8

1st core Class	1st core Factor	1st core VA rating	2nd core Class	2nd core Factor	2nd core VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	Position 10 11 12 – 13 14
0.2	FS10	10						■		■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10				■	■	■		■	■	■	■	■	E 2 – 0 A
		15				■	■	■		■	■	■	■	■	E 3 – 0 A
		30								■	■	■	■	■	E 4 – 0 A
1	FS5	10				■	■	■		■	■	■	■	■	H 2 – 0 A
		15				■	■	■		■	■	■	■	■	H 3 – 0 A
		30								■	■	■	■	■	H 4 – 0 A
5P	10	5				■	■	■		■	■	■	■	■	L 1 – 0 A
		10								■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5				■	■	■		■	■	■	■	■	Q 1 – 0 A
		10					■	■		■	■	■	■	■	Q 2 – 0 A
		15						■		■	■	■	■	■	Q 3 – 0 A
		30									■	■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5	■	■	■		■	■	■	■	■	E 1 – 1 L
		10			10					■	■	■	■	■	E 2 – 2 L
		15			15							■	■	■	E 3 – 3 L
		30			30									■	E 4 – 4 L
0.5	FS5	5	10P	10	5	■	■	■		■	■	■	■	■	E 1 – 1 Q
		10			10					■	■	■	■	■	E 2 – 2 Q
		15			15							■	■	■	E 3 – 3 Q
		30			30									■	E 4 – 4 Q
1	FS5	5	5P	10	5	■	■	■		■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15						■	■	■	■	H 2 – 3 L
		15			15						■	■	■	■	H 3 – 3 L
		15			30								■	■	H 3 – 4 L
		30			30									■	H 4 – 4 L
1	FS5	5	10P	10	5	■	■	■		■	■	■	■	■	H 1 – 1 Q
		10			10					■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15						■	■	■	■	H 3 – 3 Q
		15			30							■	■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design	4 M A 7
(U_m = 12 kV, I_{th} = 40 kA, I_{PN} = 100 A)	2 6 3 – 0 M
Thermal strength 400 x I_{PN}	4
1st core class 1; instrument security factor FS5; rating 5 VA 2nd core class 5P; accuracy limit factor 10; rating 5 VA	E 1 – 1 L

Example for Order No.: 4 M A 7 2 6 3 – 0 M E 1 4 – 1 L ■ ■
Order codes:

40 kA – with primary multi-ratio

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength	Position: 10 11 12
2x 400 A 2x 500 2x 600 A	100 x I_{PN}	0
2x 300 A	150 x I_{PN}	1
2x 200 A 2x 250 A	200 x I_{PN}	2
2x 150 A	300 x I_{PN}	3
2x 100 A 2x 125 A	400 x I_{PN}	4
2x 75 A	600 x I_{PN}	6
2x 60 A	800 x I_{PN}	7
2x 50 A	1000 x I_{PN}	8

1st core			2nd core			Thermal strength								Order codes
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	10 11 12 13 14 15 16 – ★
0.2	FS10	10						■		■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10				■	■	■		■	■	■	■	■	E 2 – 0 A
		15					■	■		■	■	■	■	■	E 3 – 0 A
		30						■		■	■	■	■	■	E 4 – 0 A
1	FS5	10				■	■	■		■	■	■	■	■	H 2 – 0 A
		15				■	■	■		■	■	■	■	■	H 3 – 0 A
		30						■		■	■	■	■	■	H 4 – 0 A
5P	10	5				■	■	■		■	■	■	■	■	L 1 – 0 A
		10						■		■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5				■	■	■		■	■	■	■	■	Q 1 – 0 A
		10					■	■		■	■	■	■	■	Q 2 – 0 A
		15						■		■	■	■	■	■	Q 3 – 0 A
		30									■	■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5		■	■		■	■	■	■	■	E 1 – 1 L
		10			10						■	■	■	■	E 2 – 2 L
		15			15							■	■	■	E 3 – 3 L
		30			30								■	■	E 4 – 4 L
0.5	FS5	5	10P	10	5		■	■		■	■	■	■	■	E 1 – 1 Q
		10			10						■	■	■	■	E 2 – 2 Q
		15			15							■	■	■	E 3 – 3 Q
		30			30								■	■	E 4 – 4 Q
1	FS5	5	5P	10	5	■	■	■		■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15						■	■	■	■	H 2 – 3 L
		15			15						■	■	■	■	H 3 – 3 L
		15			30								■	■	H 3 – 4 L
		30			30								■	■	H 4 – 4 L
1	FS5	5	10P	10	5	■	■	■		■	■	■	■	■	H 1 – 1 Q
		10			10					■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15						■	■	■	■	H 3 – 3 Q
		15			30								■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 40 kA, I_{PN} = 2x 100 A)
Thermal strength 400 x I_{PN}
1st core class 0.2; instrument security factor FS10; rating 10 VA
2nd core without

	Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16	Order codes
Example for Order No.:	4 M A 7 2 6 3 – 3 M C 2 4 – 0 A	■ ■
Order codes:		

000113

Equipment Selection

4MA7 indoor support-type current transformer, block-type design

2

50 kA

10th to 14th position

Core versions

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes

Order No.: 4 M A 7 ■ 6 7 – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

(Positions 15, 16 and ★: s.p. 40)

At rated primary current I_{PN}	Thermal strength	Position 12
500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
400 A	150 x I_{PN}	1
250 A 300 A	200 x I_{PN}	2
200 A	300 x I_{PN}	3
125 A 150 A	400 x I_{PN}	4
100 A	500 x I_{PN}	5
75 A	800 x I_{PN}	7
60 A	1000 x I_{PN}	8

1st core Class	1st core Factor	1st core VA rating	2nd core Class	2nd core Factor	2nd core VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	Order No. positions 10–14
0.2	FS10	10							■	■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10				■	■		■	■	■	■	■	■	E 2 – 0 A
		15					■		■	■	■	■	■	■	E 3 – 0 A
		30							■	■	■	■	■	■	E 4 – 0 A
1	FS5	10				■	■		■	■	■	■	■	■	H 2 – 0 A
		15				■	■		■	■	■	■	■	■	H 3 – 0 A
		30							■	■	■	■	■	■	H 4 – 0 A
5P	10	5				■	■		■	■	■	■	■	■	L 1 – 0 A
		10							■	■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5				■	■		■	■	■	■	■	■	Q 1 – 0 A
		10					■		■	■	■	■	■	■	Q 2 – 0 A
		15							■	■	■	■	■	■	Q 3 – 0 A
		30									■	■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E 1 – 1 L
		10			10					■	■	■	■	■	E 2 – 2 L
		15			15							■	■	■	E 3 – 3 L
		30			30									■	E 4 – 4 L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E 1 – 1 Q
		10			10					■	■	■	■	■	E 2 – 2 Q
		15			15						■	■	■	■	E 3 – 3 Q
		30			30									■	E 4 – 4 Q
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15						■	■	■	■	H 2 – 3 L
		15			15						■	■	■	■	H 3 – 3 L
		15			30								■	■	H 3 – 4 L
		30			30									■	H 4 – 4 L
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H 1 – 1 Q
		10			10				■	■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15						■	■	■	■	H 3 – 3 Q
		15			30							■	■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design	4 M A 7
(U_m = 12 kV, I_{th} = 50 kA, I_{PN} = 100 A)	2 6 7 – 0 M
Thermal strength 500 x I_{PN}	5
1st core class 0.5; instrument security factor FS5; rating 5 VA 2nd core class 5P; accuracy limit factor 10; rating 5 VA	E 1 – 1 L

Example for Order No.: 4 M A 7 2 6 7 – 0 M E 1 5 – 1 L ■ ■

Order codes:

50 kA – with primary multi-ratio

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength	Position: 12	Order codes
2x 500 A 2x 600 A	100 x I_{PN}	0	
2x 400 A	150 x I_{PN}	1	
2x 250 A 2x 300 A	200 x I_{PN}	2	
2x 200 A	300 x I_{PN}	3	
2x 125 A 2x 150 A	400 x I_{PN}	4	
2x 100 A	500 x I_{PN}	5	
2x 75 A	800 x I_{PN}	7	
2x 50 A 2x 60 A	1000 x I_{PN}	8	

1st core			2nd core			Thermal strength									
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	10 11 12 – 13 14 15 16
0.2	FS10	10							■	■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10				■	■		■	■	■	■	■	■	E 2 – 0 A
		15					■		■	■	■	■	■	■	E 3 – 0 A
		30							■	■	■	■	■	■	E 4 – 0 A
1	FS5	10				■	■		■	■	■	■	■	■	H 2 – 0 A
		15				■	■		■	■	■	■	■	■	H 3 – 0 A
		30							■	■	■	■	■	■	H 4 – 0 A
5P	10	5				■	■		■	■	■	■	■	■	L 1 – 0 A
		10							■	■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30									■	■	■	■	L 4 – 0 A
10P	10	5				■	■		■	■	■	■	■	■	Q 1 – 0 A
		10							■	■	■	■	■	■	Q 2 – 0 A
		15								■	■	■	■	■	Q 3 – 0 A
		30									■	■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E 1 – 1 L
		10			10					■	■	■	■	■	E 2 – 2 L
		15			15								■	■	E 3 – 3 L
		30			30								■	■	E 4 – 4 L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E 1 – 1 Q
		10			10					■	■	■	■	■	E 2 – 2 Q
		15			15							■	■	■	E 3 – 3 Q
		30			30								■	■	E 4 – 4 Q
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15							■	■	■	H 2 – 3 L
		15			15							■	■	■	H 3 – 3 L
		15			30								■	■	H 3 – 4 L
		30			30								■	■	H 4 – 4 L
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H 1 – 1 Q
		10			10					■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15						■	■	■	■	H 3 – 3 Q
		15			30								■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

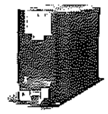
Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 50 kA, I_{PN} = 2x 100 A)
Thermal strength 500 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 5 VA
2nd core class 5P; accuracy limit factor 10; rating 5 VA

	Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16	Order codes
	4 M A 7	
	2 6 7 – 3 M	
	5	
	E 1 – 1 L	
Example for Order No.:	4 M A 7 2 6 7 – 3 M E 1 5 – A	
Order codes:		

000114

Equipment Selection

4MA7 indoor support-type current transformer, block-type design



2

63 kA

10th to 14th position

Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes
Order No.:	4	M	A	7	■	7	1	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
																	s. p. 40	s. p. 40		s. p. 40	

At rated primary current I_{PN}	Thermal strength	Position 12
750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
500 A 600 A	150 x I_{PN}	1
400 A	200 x I_{PN}	2
250 A 300 A	300 x I_{PN}	3
200 A	400 x I_{PN}	4
125 A 150 A	500 x I_{PN}	5
100 A	800 x I_{PN}	7
75 A	1000 x I_{PN}	8

1st core			2nd core			Thermal strength									Position 10–14
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	
0.2	FS10	10							■	■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10				■	■		■	■	■	■	■	■	E 2 – 0 A
		15					■		■	■	■	■	■	■	E 3 – 0 A
		30							■	■	■	■	■	■	E 4 – 0 A
1	FS5	10				■	■		■	■	■	■	■	■	H 2 – 0 A
		15				■	■		■	■	■	■	■	■	H 3 – 0 A
		30							■	■	■	■	■	■	H 4 – 0 A
5P	10	5				■	■		■	■	■	■	■	■	L 1 – 0 A
		10							■	■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5				■	■		■	■	■	■	■	■	Q 1 – 0 A
		10					■		■	■	■	■	■	■	Q 2 – 0 A
		15							■	■	■	■	■	■	Q 3 – 0 A
		30									■	■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E 1 – 1 L
		10			10					■	■	■	■	■	E 2 – 2 L
		15			15							■	■	■	E 3 – 3 L
		30			30									■	E 4 – 4 L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E 1 – 1 Q
		10			10					■	■	■	■	■	E 2 – 2 Q
		15			15							■	■	■	E 3 – 3 Q
		30			30									■	E 4 – 4 Q
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15					■	■	■	■	■	H 2 – 3 L
		15			15						■	■	■	■	H 3 – 3 L
		15			30								■	■	H 3 – 4 L
		30			30									■	H 4 – 4 L
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H 1 – 1 Q
		10			10				■	■	■	■	■	■	H 2 – 2 Q
		10			15					■	■	■	■	■	H 2 – 3 Q
		15			15						■	■	■	■	H 3 – 3 Q
		15			30							■	■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design — 4 M A 7

(U_m = 12 kV, I_{th} = 63 kA, I_{PN} = 100 A) — 2 7 1 – 0 M

Thermal strength 800 x I_{PN} — 7

1st core class 0.5; instrument security factor FS5; rating 15 VA

2nd core without — E 3 – 0 A

Example for Order No.: 4 M A 7 2 7 1 – 0 M E 3 7 – 0 A ■ ■

Order codes:

63 kA – with primary multi-ratio

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength
2x 500 A 2x 600 A	150 x I_{PN}
2x 400 A	200 x I_{PN}
2x 250 A 2x 300 A	300 x I_{PN}
2x 200 A	400 x I_{PN}
2x 125 A 2x 150 A	500 x I_{PN}
2x 100 A	800 x I_{PN}
2x 75 A	1000 x I_{PN}

1st core			2nd core			Thermal strength							
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}
0.2	FS10	10							■	■	■	■	■	
		15								■	■	■	■	
0.5	FS5	10					■	■	■	■	■	■	■	
		15						■	■	■	■	■	■	
		30							■	■	■	■	■	
1	FS5	10					■	■	■	■	■	■	■	
		15					■	■	■	■	■	■	■	
		30								■	■	■	■	
5P	10	5					■	■	■	■	■	■	■	
		10							■	■	■	■	■	
		15							□	■	■	■	■	
		30										■	■	
10P	10	5					■	■	■	■	■	■	■	
		10						■	■	■	■	■	■	
		15							■	■	■	■	■	
		30									■	■	■	
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	
		10			10					■	■	■	■	
		15			15							■	■	
		30			30								■	
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	
		10			10					■	■	■	■	
		15			15							■	■	
		30			30								■	
1	FS5	5	5P	10	5		■		■	■	■	■	■	
		10			10					■	■	■	■	
		10			15					■	■	■	■	
		15			15						■	■	■	
		15			30								■	
		30			30								■	
1	FS5	5	10P	10	5		■		■	■	■	■	■	
		10			10					■	■	■	■	
		10			15					■	■	■	■	
		15			15						■	■	■	
		15			30								■	
		30			30								■	

■ Feasible (other combinations on request) □ Not for 2x 125 A

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 63 kA, I_{PN} = 2x 100 A)
Thermal strength 800 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 5 VA
2nd core class 10P; accuracy limit factor 10; rating 5 VA

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes
Order No.:	4	M	A	7	■	7	1	–	■	■	■	■	■	–	■	■	■	■	–	■ ■ ■
																	s. p. 40	s. p. 40	s. p. 40	
													1							
													2							
													3							
													4							
													5							
													7							
													8							
											C	2		–	0	A				
											C	3		–	0	A				
											E	2		–	0	A				
											E	3		–	0	A				
											E	4		–	0	A				
											H	2		–	0	A				
											H	3		–	0	A				
											H	4		–	0	A				
											L	1		–	0	A				
											L	2		–	0	A				
											L	3		–	0	A				
											L	4		–	0	A				
											Q	1		–	0	A				
											Q	2		–	0	A				
											Q	3		–	0	A				
											Q	4		–	0	A				
											E	1		–	1	L				
											E	2		–	2	L				
											E	3		–	3	L				
											E	4		–	4	L				
											E	1		–	1	Q				
											E	2		–	2	Q				
											E	3		–	3	Q				
											E	4		–	4	Q				
											H	1		–	1	L				
											H	2		–	2	L				
											H	2		–	3	L				
											H	3		–	3	L				
											H	3		–	4	L				
											H	4		–	4	L				
											H	1		–	1	Q				
											H	2		–	2	Q				
											H	2		–	3	Q				
											H	3		–	3	Q				
											H	3		–	4	Q				
											H	4		–	4	Q				

Example for Order No.:	4	M	A	7	2	7	1	–	3	M	E	1	7	–	1	Q	■	■		
Order codes:																				

000115

Equipment Selection

4MA7 indoor support-type current transformer, block-type design

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes

Order No.: 4 M A 7 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ■ ★ ■ ■ ■

15th position
Rated secondary current

Rated current for 1st core	Rated current for 2nd core	
1 A	Without 2nd core	0 A A
5 A	Without 2nd core	0 A B
1 A	1 A	C
5 A	5 A	D
1 A	5 A	E
5 A	1 A	F

16th position
Additional features

Options	
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval [1]	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

1) Only for class 0.2 and 0.5

Special versions

Options		
With routine test certificate in German/English		– Z A 1 0
With capacitive layer for voltage detecting system	6 kV	– Z C 0 6
	10 kV	– Z C 1 0
	15 kV	– Z C 1 5
Differential earth-fault balance in protection core		– Z D 1 0
Other special versions on request		

Configuration example

Indoor support-type current transformer, block-type design 4 M A 7

Maximum operating voltage U_m = 12 kV 2

Rated lightning impulse withstand voltage U_p = 75 kV 7 1 –

Rated short-duration power-frequency withstand voltage U_d = 28 kV 3 M

Rated short-time thermal current I_{th} = 63 kA 7

Rated primary current I_{PN} = 2x 100 A E 1 – 1 Q

Thermal strength 800 x I_{PN} E

1st core class 0.5; instrument security factor FS5; rating 5 VA 1

2nd core class 10P; accuracy limit factor 10; rating 5 VA – Z A 1 0

Rated secondary current 1st core 1A; 2nd core 5A – Z C 1 0

Power frequency 50 Hz; marking according to IEC

With routine test certificate in German/English

With capacitive layer for voltage detecting system 10 kV

Example for Order No.: 4 M A 7 2 7 1 – 3 M E 1 7 – 1 Q E 1 – Z

Order codes: A 1 0 + C 1 0

4MB1 indoor support-type current transformer, single-turn design

5th position
Operating voltage (maximum value)

Operating voltage U_m kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 – ★ Order codes	
12	75	28	4 M B 1 2	See page 42
17.5	95	38	4 M B 1 3	See page 42
24	128	50	4 M B 1 4	See page 42

6th/7th position
Rated short-time thermal current

Rated short-time thermal current I_{th} kA		
150	7 8	See page 42
200	8 2	See page 42
250	8 4	See page 43
300	8 5	See page 43
500	8 8	See page 43

8th/9th position
Rated primary current

Rated primary current I_N A	Remark	Rated short-time thermal current 150 kA	200 kA	250 kA	300 kA	500 kA		
1500		■					1 D	See page 43
2000			■				1 F	See page 43
2500				■			1 G	See page 43
3000					■		1 H	See page 43
4000						■	1 J	See page 43
5000	Only 4MB13					■	1 K	See page 43
6000	Only 4MB13					■	1 L	See page 43

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, single-turn design
Maximum operating voltage U_m = 24 kV
Rated lightning impulse withstand voltage U_p = 125 kV
Rated short-duration power-frequency withstand voltage U_d = 50 kV
Rated short-time thermal current I_{th} = 300 kA
Rated primary current I_{PN} = 3000 A

Example for Order No.: 4 M B 1 4 8 5 – 1 H ■ ■ – ■ ■ ■ ■
Order codes:

000116

Equipment Selection

4MB1 indoor support-type current transformer, single-turn design

10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes
Order No.:	4	M	B	1	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■

At rated primary current I_{PN}	Thermal strength			
1500 A 2000 A 2500 A 3000 A 4000 A 5000 A 6000 A	100 x I_{PN}			
		0		
				See page 43
				See page 43
				See page 43

1st core			2nd core			Rated primary current I_{PN}									
Class	Factor	VA rating	Class	Factor	VA rating	1500 A	2000 A	2500 A	3000 A	4000 A	5000 A	6000 A			
0.2	FS10	15				■	■	■	■	■	■	■	C	3	– 0 A
		30				■	■	■	■	■	■	■	C	4	– 0 A
0.5	FS10	15				■	■	■	■	■	■	■	F	3	– 0 A
		30				■	■	■	■	■	■	■	F	4	– 0 A
		60				■	■	■	■	■	■	■	F	6	– 0 A
1	FS10	15				■	■	■	■	■	■	■	J	3	– 0 A
		30				■	■	■	■	■	■	■	J	4	– 0 A
		60				■	■	■	■	■	■	■	J	6	– 0 A
5P	10	30				■	■	■	■	■	■	■	L	4	– 0 A
		60				■	■	■	■	■	■	■	L	6	– 0 A
10P	10	30				■	■	■	■	■	■	■	Q	4	– 0 A
		60				■	■	■	■	■	■	■	Q	6	– 0 A
0.5	FS10	15	5P	10	15	■	■	■	■	■	■	■	F	3	– 3 L
		30			30	■	■	■	■	■	■	■	F	4	– 4 L
		30			60						■	■	F	6	– 6 L
1	FS10	15	5P	10	15	■	■	■	■	■	■	■	J	3	– 3 L
		30			30	■	■	■	■	■	■	■	J	4	– 4 L
		60			60						■	■	J	6	– 6 L
0.5	FS10	15	10P	10	15	■	■	■	■	■	■	■	F	3	– 3 Q
		30			30	■	■	■	■	■	■	■	F	4	– 4 Q
		60			60						■	■	F	6	– 6 Q
1	FS10	15	10P	10	15	■	■	■	■	■	■	■	J	3	– 3 Q
		30			30	■	■	■	■	■	■	■	J	4	– 4 Q
		60			60						■	■	J	6	– 6 Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, single-turn design
(U_m = 24 kV, I_{th} = 300 kA, I_{PN} = 3000 A)
Thermal strength 100 x I_{PN}
1st core class 0.5; instrument security factor FS10; rating 30 VA
2nd core class 5P; accuracy limit factor 10; rating 30 VA

	4	M	B	1																
					4	8	5	–	1	H										
												0								
											F	4		–	4	L				
Example for Order No.:	4	M	B	1	4	8	5	–	1	H	F	4	0	–	4	L	■	■		
Order codes:																				

Equipment Selection

4MB1 indoor support-type current transformer, single-turn design

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes

Order No.: 4 M B 1 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ■ ■ ■

15th position
Rated secondary current

Rated current for 1st core	Rated current for 2nd core	
1 A	Without 2nd core	0 A A
5 A	Without 2nd core	0 A B
1 A	1 A	C
5 A	5 A	D
1 A	5 A	E
5 A	1 A	F

16th position
Additional features

Options	
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval 1)	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

1) Only for class 0.2 and 0.5

Special versions

Options	
With routine test certificate in German/English	– Z A 1 0
Other special versions on request	

Configuration example

Indoor support-type current transformer, single-turn design
Maximum operating voltage U_m = 24 kV
Rated lightning impulse withstand voltage U_p = 125 kV
Rated short-duration power-frequency withstand voltage U_d = 50 kV
Rated short-time thermal current I_{th} = 300 kA
Rated primary current I_{PN} = 3000 A
Thermal strength 100 x I_{PN}
1st core class 0.5; instrument security factor FS10; rating 30 VA
2nd core class 5P; accuracy limit factor 10; rating 30 VA
Rated secondary current 1st core 5 A; 2nd core 5 A
Power frequency 60 Hz; marking according to IEC

Example for Order No.: 4 M B 1 4 8 5 – 1 H F 4 0 – 4 L D 6

Order codes:

00011

4MC2 indoor bushing-type current transformer, single-turn design

5th position
Operating voltage (maximum value)

Operating voltage U_m kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 – Order codes Order No.: 4 M C 2 ■ ■ ■ – ■ ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■	
12	75	28	4 M C 2 2	See page 45
24	125	50	4 M C 2 4	See page 45
36	170	70	4 M C 2 6	See page 45

6th to 9th position
Rated short-time thermal current/ Rated primary current

Rated short-time thermal current I_{th} kA	Rated primary current I_{PN} A		
15	150	4 3 – 0 P	See page 45
20	200	4 8 – 0 Q	See page 45
30	300	5 6 – 0 S	See page 45
40	400	6 3 – 0 T	See page 45
50	500	6 7 – 0 U	See page 45
60	600	7 0 – 0 V	See page 46
80	800	7 3 – 0 X	See page 46
100	1000	7 5 – 1 A	See page 46
120	1200	7 6 – 1 B	See page 46
150	1500	7 8 – 1 D	See page 46
200	2000	8 2 – 1 F	See page 46
250	2500	8 4 – 1 G	See page 46
300	3000	8 5 – 1 H	See page 46

Configuration example
Indoor bushing-type current transformer, single-turn design
Maximum operating voltage U_m = 36 kV
Rated lightning impulse withstand voltage U_p = 170 kV
Rated short-duration power-frequency withstand voltage U_d = 70 kV
Rated short-time thermal current I_{th} = 50 kA
Rated primary current I_{PN} = 500 A

Example for Order No.: 4 M C 2 6 6 7 – 0 U ■ ■ ■ – ■ ■ ■ ■
Order codes:

Equipment Selection

4MC2 indoor bushing-type current transformer, single-turn design

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength
150 A 200 A 300 A 400 A 500 A 600 A 800 A 1000 A 1200 A 1500 A 2000 A 2500 A 3000 A	100 x I_{PN}

1st core			2nd core			Rated primary current I_{PN}				
Class	Factor	VA rating	Class	Factor	VA rating	150 A	200 A	300–600 A	800–1500 A	2000–3000 A
0.2	FS10	10				■	■	■	■	■
		15				■	■	■	■	■
0.5	FS5	15				■	■	■	■	
		30				■	■	■	■	■
0.5	FS10	15								■
1	FS5	15				■	■	■	■	
		30				■	■	■	■	■
1	FS10	15								■
10P	10	15				■	■	■	■	■
		30				■	■	■	■	■
		60				■	■	■	■	■
0.2	FS10	10	10P	10	30	■	■	■	■	■
		15			30	■	■	■	■	■
0.5	FS5	15	10P	10	15	■	■	■	■	
		15			30	■	■	■	■	
		30			30	■	■	■	■	■
		30			60		■	■	■	■
0.5	FS10	15	10P	10	15					■
		15			30					■
1	FS5	15	10P	10	15	■	■	■	■	
		15			30	■	■	■	■	
		30			30	■	■	■	■	■
		30			60		■	■	■	■
1	FS10	15	10P	10	15					■
		15			30					■

■ Feasible (other combinations on request)

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes

Order No.: 4 M C 2 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

See page 46 See page 46 See page 46

0

C	2		–	0	A
C	3		–	0	A
E	3		–	0	A
E	4		–	0	A
F	3		–	0	A
H	3		–	0	A
H	4		–	0	A
J	3		–	0	A
Q	3		–	0	A
Q	4		–	0	A
Q	6		–	0	A
C	2		–	4	Q
C	3		–	4	Q
E	3		–	3	Q
E	3		–	4	Q
E	4		–	4	Q
E	4		–	6	Q
F	3		–	3	Q
F	3		–	4	Q
H	3		–	3	Q
H	3		–	4	Q
H	4		–	4	Q
H	4		–	6	Q
J	3		–	3	Q
J	3		–	4	Q

Configuration example
Indoor bushing-type current transformer, single-turn design
(U_m = 36 kV, I_{th} = 50 kA, I_{PN} = 500 A)
Thermal strength 100 x I_{PN}
1st core class 1; instrument security factor FS5; rating 30 VA
2nd core class 10P; accuracy limit factor 10; rating 30 VA

Example for Order No.: 4 M C 2 6 6 7 – 0 U H 4 0 – 4 Q ■ ■

Order codes:

000118

Equipment Selection

4MC2 indoor bushing-type current transformer, single-turn design

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes

Order No.: 4 M C 2 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

15th position
Rated secondary current

Rated current for 1st core	Rated current for 2nd core	
1 A	Without 2nd core	0 A A
5 A	Without 2nd core	0 A B
1 A	1 A	C
5 A	5 A	D
1 A	5 A	E
5 A	1 A	F

16th position
Additional features

Options	
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval 1)	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

1) Only for class 0.2 and 0.5

Special versions

Options	
With routine test certificate in German/English	– Z A 1 0
Other special versions on request	

Configuration example

Indoor bushing-type current transformer, single-turn design
Maximum operating voltage U_m = 36 kV
Rated lightning impulse withstand voltage U_p = 170 kV
Rated short-duration power-frequency withstand voltage U_d = 70 kV
Rated short-time thermal current I_{th} = 50 kA
Rated primary current I_{PN} = 500 A
Thermal strength 100 x I_{PN}
1st core class 1; instrument security factor FS5; rating 30 VA
2nd core class 10P; accuracy limit factor 10; rating 30 VA
Rated secondary current 1st core 5 A; 2nd core 1 A
Power frequency 50 Hz; marking according to VDE

Example for Order No.: 4 M C 2 6 6 7 – 0 U H 4 0 – 4 Q F 0

Order codes:

4MC3 indoor bar-primary bushing-type current transformer

5th position
Operating voltage (maximum value)

Operating voltage	Rated lightning impulse withstand voltage	Rated short-duration power-frequency withstand voltage	Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16	Order codes
U_m kV	U_p kV	U_d kV	Order No.: 4 M C 3 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★	■ ■ ■
12	75	28	4 M C 3 2	See page 48
24	125	50	4 M C 3 4	See page 48
36	170	70	4 M C 3 6	See page 48

6th to 9th position
Rated short-time thermal current/ Rated primary current

Rated short-time thermal current	Rated primary current		
I_{th} kA	I_{PN} A		
200	2000	8 2 – 1 F	See page 48
250	2500	8 4 – 1 G	See page 48
300	3000	8 5 – 1 H	See page 48
400	4000	8 7 – 1 J	See page 48
500	5000	8 8 – 1 K	See page 49
600	6000	7 0 – 1 L	See page 49
800	8000	7 2 – 1 N	See page 49
1000	10000	7 3 – 1 P	See page 49

Configuration example
Indoor bar-primary bushing-type current transformer
Maximum operating voltage U_m = 12 kV
Rated lightning impulse withstand voltage U_p = 75 kV
Rated short-duration power-frequency withstand voltage U_d = 28 kV
Rated short-time thermal current I_{th} = 400 kA
Rated primary current I_{PN} = 4000 A

Example for Order No.: 4 M C 3 2 8 7 – 1 J ■ ■ ■ – ■ ■ ■ ■
Order codes:

000119

Equipment Selection

4MC3 indoor bar-primary bushing-type current transformer

10th to 14th position
Core versions

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 — Order codes
Order No.: 4 M C 3 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■

See page 49 See page 49 See page 49

At rated primary current I_{PN}	Thermal strength
2000 A 2500 A 3000 A 4000 A 5000 A 6000 A 8000 A 10000 A	100 x I_{PN}
	0

1st core			2nd core			3rd core			4th core			Rated primary current I_{PN}			10th to 14th position
Class	Factor	VA rating	Class	Factor	VA rating	Class	Factor	VA rating	Class	Factor	VA rating	2000–3000 A	4000–6000 A	8000–10000 A	
0.2	FS10	15										■	■	■	C 3 – 0 A
		30										■	■	■	C 4 – 0 A
0.5	FS10	15										■	■	■	F 3 – 0 A
		30										■	■	■	F 4 – 0 A
1	FS10	30										■	■	■	J 4 – 0 A
		60										■	■	■	J 6 – 0 A
10P	10	30										■	■	■	Q 4 – 0 A
		60										■	■	■	Q 6 – 0 A
10P	20	60										■	■	■	S 6 – 0 A
		100										■	■	■	S 8 – 0 A
0.5	FS10	15	10P	10	30							■	■	■	F 3 – 4 Q
		15			60							■	■	■	F 3 – 6 Q
		15	10P	20	60							■	■	■	F 3 – 6 S
		30			60							■	■	■	F 4 – 6 S
1	FS10	60	10P	20	100							■	■	■	J 6 – 8 S
10P	10	60										■	■	■	Q 6 – 8 S
10P	20	60										■	■	■	S 6 – 8 S
		100										■	■	■	S 8 – 8 S
0.5	FS10	15	10P	10	30	10P	10	60				■	■	■	Y 0 – 0 A
1	FS10	30	10P	20	60	10P	20	100				■	■	■	Y 0 – 0 B
0.2	FS10	15	0.2	FS10	30	10P	10	30				■	■	■	Y 0 – 0 C
0.5	FS10	15			30			30				■	■	■	Y 0 – 0 D
0.2	FS10	30	1	FS10	60	10P	10	60	10P	20	100	■	■	■	Y 0 – 1 A
0.5	FS10	30			60			60			100	■	■	■	Y 0 – 1 B
1	FS10	30			60			60			100	■	■	■	Y 0 – 1 C
0.2	FS10	30	1	FS10	60	10P	10	60	10P	20	100	■	■	■	Y 0 – 1 D
0.5	FS10	30			60			60			100	■	■	■	Y 0 – 1 E
1	FS10	30			60			60			100	■	■	■	Y 0 – 1 F

■ Feasible (other combinations on request)

Configuration example

Indoor bar-primary bushing-type current transformer
(U_m = 12 kV, I_{th} = 400 kA, I_{PN} = 4000 A)
Thermal strength 100 x I_{PN}
1st core class 0.5; instrument security factor FS10; rating 15 VA
2nd core class 0.2; instrument security factor FS10; rating 30 VA
3rd core class 10P; accuracy limit factor 10; rating 30 VA

Example for Order No.: 4 M C 3 2 8 7 – 1 J Y 0 0 – 0 D ■ ■
Order codes:

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes
Order No.: 4 M C 3 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

15th position
Rated secondary current

Rated current for 1st core	Rated current for 2nd core	Rated current for 3rd core	Rated current for 4th core	
1 A	Without	Without	Without	0 A A
5 A	Without	Without	Without	0 A B
1 A	1 A	Without	Without	C
5 A	5 A	Without	Without	D
1 A	5 A	Without	Without	E
5 A	1 A	Without	Without	F
1 A	1 A	1 A	Without	G
5 A	5 A	5 A	Without	H
1 A	1 A	1 A	1 A	J
5 A	5 A	5 A	5 A	K

16th position
Additional features

Options	
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval [1]	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

1) Only for class 0.2 and 0.5

Special versions

Options		
With routine test certificate in German/English		– Z A 1 0
Size (for specification see the following pages)	11	– Z A 1 1
	12	– Z A 1 2
	21	– Z A 2 1
	22	– Z A 2 2
	31	– Z A 3 1
	32	– Z A 3 2
	41	– Z A 4 1
	42	– Z A 4 2
	51	– Z A 5 1
	52	– Z A 5 2
	61	– Z A 6 1
	62	– Z A 6 2
	72	– Z A 7 2
	73	– Z A 7 3
Other special versions on request		

Configuration example

Indoor bar-primary bushing-type current transformer — 4 M C 3
Maximum operating voltage U_m = 12 kV — 2
Rated lightning impulse withstand voltage U_p = 75 kV
Rated short-duration power-frequency withstand voltage U_d = 28 kV — 8 7
Rated short-time thermal current I_{th} = 400 kA — – 1 J
Rated primary current I_{PN} = 4000 A — 0
Thermal strength 100 x I_{PN}
1st core class 0.5; instrument security factor FS10; rating 15 VA — Y 0
2nd core class 0.2; instrument security factor FS10; rating 30 VA — – 0 D
3rd core class 10P; accuracy limit factor 10; rating 30 VA — G
Rated secondary current 1st core 1 A; 2nd core 1 A; 3rd core 1 A — 1
Power frequency 50 Hz; marking according to IEC — – Z A 4 2
Size 42

Example for Order No.: 4 M C 3 2 8 7 – 1 J Y 0 0 – 0 D G 1 – Z A 4 2
Order codes: A 4 2

000120

Size specification for 4MC32 transformers [1]

10th to 14th position of Order No.	6th to 9th position of Order No.							
	82-1F	84-1G	85-1H	87-1J	88-1K	90-1L	92-1N	93-1P
C30-0A C40-0A F30-0A F40-0A J40-0A J60-0A Q40-0A Q60-0A S60-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	41, 42, 51, 52, 61, 62, 72, 73
S80-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	12, 21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 61, 62, 72, 73	31, 32, 41, 42, 51, 52, 62, 72, 73	41, 42, 51, 52, 62, 72, 73
F30-4Q	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62, 72, 73	32, 42, 51, 52, 62, 72, 73	51, 52, 62, 72, 73
F30-6Q	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	12, 21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62, 72, 73	32, 42, 51, 52, 62, 72, 73	42, 51, 52, 62, 72, 73
F30-6S F40-6S	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	12, 21, 22, 31, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 61, 62	42, 51, 52, 62, 72, 73	42, 51, 52, 62, 72, 73
J60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	42, 52, 62, 72, 73
Q60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 32, 41, 42, 51, 52, 61, 62	32, 41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
S60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 32, 41, 42, 52, 61, 62	32, 41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
S80-8S	21, 22, 32	12, 21, 22, 32	21, 22, 31, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 62	41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
Y00-0A	11, 12, 21, 22, 31, 32	11,12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52	32, 42, 51, 52, 61, 62	52, 62, 72, 73	52, 62, 72, 73
Y00-0B	21, 22, 32	21, 22, 32	22, 32, 41, 42	22, 32, 42, 51, 52	22, 32, 42, 52	22, 42, 52, 62	42, 52, 62, 72, 73	52, 62, 72, 73
Y00-0C Y00-0D	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	12, 22, 32, 41, 42, 51, 52	22, 32, 42, 51, 52	52, 62, 72, 73	52, 62, 72, 73
Y00-1A Y00-1B Y00-1C	12, 22, 32	22, 32	22, 32, 42	22, 32, 42, 52	42, 52	52, 62	73	73
Y00-1D Y00-1E Y00-1F	22, 32	22, 32	22, 32, 42	41, 52	52	52, 62	73	73

1) Selection for transformers with rated secondary current 1 A. Sizes for 5 A on request

Size specification for 4MC34 transformers [1]

10th to 14th position of Order No.	6th to 9th position of Order No.							
	82-1F	84-1G	85-1H	87-1J	88-1K	90-1L	92-1N	93-1P
C30-0A C40-0A F30-0A F40-0A J40-0A J60-0A Q40-0A Q60-0A S60-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	41, 42, 51, 52, 61, 62, 72, 73
S80-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 61, 62, 72, 73	31, 32, 41, 42, 51, 52, 62, 72, 73	41, 42, 51, 52, 62, 72, 73
F30-4Q	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62, 72, 73	32, 42, 51, 52, 62, 72, 73	51, 52, 62, 72, 73
F30-6Q	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62, 72, 73	32, 42, 51, 52, 62, 72, 73	42, 51, 52, 62, 72, 73
F30-6S F40-6S	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 61, 62	42, 51, 52, 62, 72, 73	42, 51, 52, 62, 72, 73
J60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	42, 52, 62, 72, 73
Q60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 61, 62	32, 41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
S60-8S	21, 22, 31, 32	21, 22, 31, 32	21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 32, 41, 42, 52, 61, 62	42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
S80-8S	21, 22, 32	21, 22, 32	21, 22, 31, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 62	41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
Y00-0A	11, 12, 21, 22, 31, 32	11,12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 32, 42, 51, 52, 61, 62	22, 32, 42, 51, 52, 61, 62, 72, 73	42, 52, 62, 72, 73
Y00-0B	22, 32	21, 22, 32	22, 32, 41, 42	22, 32, 42, 51, 52	22, 32, 42, 52	22, 42, 52, 62	42, 52, 62, 72, 73	52, 62, 72, 73
Y00-0C Y00-0D	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 32, 42, 51, 52	52, 62, 72, 73	52, 62, 72, 73
Y00-1A Y00-1B Y00-1C	12, 22, 32	22, 32	22, 32, 42	22, 32, 42, 52	42, 52	52, 62	73	73
Y00-1D Y00-1E Y00-1F	22, 32	22, 32	22, 32, 42	41, 52	52	52, 62	73	73

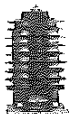
1) Selection for transformers with rated secondary current 1 A. Sizes for 5 A on request

000121

Size specification for 4MC36 transformers [1]

10th to 14th position of Order No.	6th to 9th position of Order No.							
	82-1F	84-1G	85-1H	87-1J	88-1K	90-1L	92-1N	93-1P
C30-0A C40-0A F30-0A F40-0A J40-0A J60-0A Q40-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	11, 12, 21, 22, 31, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	41, 42, 51, 52, 61, 62, 72, 73
Q60-0A S60-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	11, 12, 21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	41, 42, 51, 52, 61, 62, 72, 73
S80-0A	12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 61, 62	41, 42, 51, 52, 62, 72, 73	41, 42, 51, 52, 62, 72, 73
F30-4Q	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62	42, 52, 62, 72, 73	52, 62, 72, 73
F30-6Q	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62	42, 52, 62, 72, 73	52, 62, 72, 73
F30-6S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 32, 42, 51, 52, 61, 62	42, 52, 62, 72, 73	52, 62, 72, 73
F40-6S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 32, 41, 42, 51, 52, 61, 62	41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
J60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	41, 42, 51, 52, 61, 62, 72, 73	42, 52, 62, 72, 73
Q60-8S	21, 22, 31, 32	12, 21, 22, 31, 32	21, 22, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 61, 62	42, 51, 52	42, 52, 62, 72, 73
S60-8S	21, 22, 32	21, 22, 32	21, 22, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 41, 42, 51, 52, 61, 62	42, 52, 62, 72, 73	52, 62, 72, 73
S80-8S	21, 22, 32	31, 32, 42	21, 22, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 62	42, 52, 62, 72, 73	52, 62, 72, 73
Y00-0A	11, 12, 21, 22, 31, 32	11,12, 21, 22, 31, 32	21, 22, 31, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 42, 52, 61, 62	52	52, 62, 72, 73
Y00-0B	22, 32	22, 32	22, 32	22, 42, 52	42, 52	42, 52, 62	52	73
Y00-0C Y00-0D	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	21, 22, 31, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 52, 62	73	73
Y00-1A Y00-1B Y00-1C	22, 32	22, 32	22, 32	42, 52	52	–	73	73
Y00-1D Y00-1E Y00-1F	22	22	22, 42	52	–	–	73	73

1) Selection for transformers with rated secondary current 1 A. Sizes for 5 A on request



4ME2 outdoor support-type current transformer

5th position
Operating voltage (maximum value)

Operating voltage U_m kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 – ★	Order codes
			Order No.: 4 M E 2 ■ ■ ■ – ■ ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★	■ ■ ■
			See page 55 See page 55 See page 55 See page 55 See page 55 See page 56 See page 56 See page 56	
12	75	28	4 M E 2 2	
24	125	50	4 M E 2 4	
36	170	70	4 M E 2 6	

6th to 9th position
Rated short-time thermal current/
Rated primary current

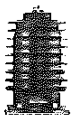
Rated short-time thermal current I_{th} kA	Rated primary current I_{PN} A	Rated primary current, with primary multi-ratio I_{PN} A	Thermal strength 300 x I_{PN}	200 x I_{PN}	100 x I_{PN}	6th to 9th position	
0.5	2x	5	■		■	0 0 – 3	A
0.6	2x	10	■		■	0 1 – 3	B
1	2x	5		■		0 3 – 3	A
1.5	2x	15	■		■	0 7 – 3	D
2.5	2x	25	■		■	1 6 – 3	F
3	2x	15		■		1 7 – 3	D
5	2x	25		■		2 5 – 3	F
5	2x	50	■		■	2 5 – 3	J
7.5	2x	75	■	■	■	3 2 – 3	L
10	2x	50		■		3 6 – 3	J
10	2x	100	■		■	3 6 – 3	M
15	2x	75		■		4 3 – 3	L
15	2x	150	■		■	4 3 – 3	P
20	2x	100		■		4 8 – 3	M
20	2x	200	■		■	4 8 – 3	Q
25	2x	250	■		■	5 4 – 3	R
30	2x	150		■		5 6 – 3	P
30	2x	300	■		■	5 6 – 3	S
40	2x	200		■		6 3 – 3	Q
40	2x	400	■		■	6 3 – 3	T
50	2x	250		■		6 7 – 3	R
50	2x	500	■		■	6 7 – 3	U
60	2x	300		■		7 0 – 3	S
60	2x	600	■		■	7 0 – 3	V

6th to 9th position continued on page 54

Configuration example
Outdoor support-type current transformer
Maximum operating voltage U_m = 24 kV
Rated lightning impulse withstand voltage U_p = 125 kV
Rated short-duration power-frequency withstand voltage U_d = 50 kV
Rated short-time thermal current I_{th} = 15 kA
Rated primary current I_{PN} = 2x 75 A

Example for Order No.: 4 M E 2 4 4 3 – 3 L ■ ■ ■ ■ ■ ■ ■
Order codes:

000122



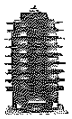
6th to 9th position (continued)
Rated short-time thermal current/ Rated primary current

Rated short-time thermal current I_{th} kA	Rated primary current I_{PN} A	Rated primary current, with primary multi-ratio I_{PN} A	Thermal strength 300 x I_{PN}	200 x I_{PN}	100 x I_{PN}	Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16	Order codes	
						Order No.: 4 M E 2 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★	■ ■ ■	
0.5	5		■		■	0 0 – 0 A		
0.6	10		■		■	0 1 – 0 B		
1	5			■		0 3 – 0 A		
1.5	15		■		■	0 7 – 0 D		
2	10			■		1 3 – 0 B		
2	20		■		■	1 3 – 0 E		
3	15			■		1 7 – 0 D		
3	30		■		■	1 7 – 0 G		
4	20			■		2 2 – 0 E		
4	40		■		■	2 2 – 0 H		
5	50		■		■	2 5 – 0 J		
6	30			■		2 6 – 0 G		
6	60		■		■	2 6 – 0 K		
7.5	75		■		■	3 2 – 0 L		
8	40			■		3 3 – 0 H		
10	50			■		3 6 – 0 J		
10	100		■		■	3 6 – 0 M		
12	60			■		3 8 – 0 K		
15	75			■		4 3 – 0 L		
15	150		■		■	4 3 – 0 P		
20	100			■		4 8 – 0 M		
20	200		■		■	4 8 – 0 Q		
25	250		■		■	5 3 – 0 R		
30	150			■		5 6 – 0 P		
30	300		■		■	5 6 – 0 S		
40	200			■		6 3 – 0 Q		
40	400		■		■	6 3 – 0 T		
50	250			■		6 7 – 0 R		
50	500		■		■	6 7 – 0 U		
60	300			■		7 0 – 0 S		
60	600		■		■	7 0 – 0 V		
80	400			■		7 3 – 0 T		
80	800		■		■	7 3 – 0 X		
100	500			■		7 5 – 0 U		
100	1000		■		■	7 5 – 1 A		
120	600			■		7 6 – 0 V		
120	1200		■		■	7 6 – 1 B		

See page 55 | See page 55 | See page 55 | See page 55 | See page 55 | See page 56 | See page 56 | See page 56

Configuration example
Outdoor support-type current transformer
(U_m = 24 kV, U_p = 125 kV, U_d = 50 kV)
Rated short-time thermal current I_{th} = 100 kA
Rated primary current I_{PN} = 1000 A

Example for Order No.: 4 M E 2 4 7 5 – 1 A ■ ■ ■ – ■ ■ ■ ■
Order codes:



10th to 14th position
Core versions

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 — Order codes
Order No.: 4 M E 2 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ – ★ ■ ■ ■

See page 56 See page 56 See page 56

At rated primary current I_{PN}	Thermal strength	10th position
0.5 0.6 1.5 2 2.5 3 4 5 6 7.5 10 15 20 25 30 40 50 60 80 100 120	100 x I_{PN}	0
1 2 3 4 5 6 8 10 12 15 20 30 40 50 60 80 100 120	200 x I_{PN}	2
0.5 0.6 1.5 2 2.5 3 4 5 6 7.5 10 15 20 25 30 40 50 60 80 100 120	300 x I_{PN}	3

1st core			2nd core			3rd core			Rated primary current I_{PN}			11th to 14th position
Class	Factor	VA rating	Class	Factor	VA rating	Class	Factor	VA rating	300 x I_{PN}	200 x I_{PN}	100 x I_{PN}	
0.2	FS10	5							■	■	■	C 1 – 0 A
		10							■	■	■	C 2 – 0 A
		15							■	■	■	C 3 – 0 A
		30							■	■	■	C 4 – 0 A
0.5	FS5	10							■	■	■	E 2 – 0 A
		15							■	■	■	E 3 – 0 A
		30							■	■	■	E 4 – 0 A
1	FS5	15							■	■	■	H 3 – 0 A
		30							■	■	■	H 4 – 0 A
5P	10	15							■	■	■	L 3 – 0 A
		30							■	■	■	L 4 – 0 A
		60							■	■	■	L 6 – 0 A
10P	10	15							■	■	■	Q 3 – 0 A
		30							■	■	■	Q 4 – 0 A
		60							■	■	■	Q 6 – 0 A
0.2	FS10	10	5P	10	30				■	■	■	C 2 – 4 L
		15			30				■	■	■	C 3 – 4 L
		30			60				■	■	■	C 4 – 6 L
0.5	FS5	10	5P	10	30				■	■	■	E 2 – 4 L
		15			30				■	■	■	E 3 – 4 L
		30			30				■	■	■	E 4 – 4 L
		30			60				■	■	■	E 4 – 6 L
1	FS5	15	5P	10	30				■	■	■	H 3 – 4 L
		30			30				■	■	■	H 4 – 4 L
		30			60				■	■	■	H 4 – 6 L
1	FS5	15	10P	10	30				■	■	■	H 3 – 4 Q
		30			30				■	■	■	H 4 – 4 Q
		30			60				■	■	■	H 4 – 6 Q
0.2	FS10	15	0.5	FS5	15	5P	10	15	■	■	■	Y 0 – 0 E
		15			30			30	■	■	■	Y 0 – 0 F
0.5	FS5	15	5P	10	15	5P	10	15	■	■	■	Y 0 – 0 G
		15			30			30	■	■	■	Y 0 – 0 H

■ Feasible (other combinations on request)

Configuration example
Outdoor support-type current transformer
(U_m = 24 kV, I_{th} = 100 kA, I_{PN} = 1000 A)
Thermal strength 300 x I_{PN}
1st core class **10P**; instrument security factor **10**; rating **60 VA**
2nd core **without**
3rd core **without**

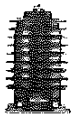
4 M E 2 4 7 5 – 1 A 3 Q 6 – 0 A

Example for Order No.: 4 M E 2 4 7 5 – 1 A Q 6 3 – 0 A ■ ■
Order codes:

000123

Equipment Selection

4ME2 outdoor support-type current transformer



Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes

Order No.: 4 M E 2 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

15th position
Rated secondary current

Rated current for 1st core	Rated current for 2nd core	Rated current for 3rd core	
1 A	Without	Without	0 A A
5 A	Without	Without	0 A B
1 A	1 A	Without	C
5 A	5 A	Without	D
1 A	5 A	Without	E
5 A	1 A	Without	F
1 A	1 A	1 A	G
5 A	5 A	5 A	H

2

16th position
Additional features

Options	
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval 1)	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

1) Only for class 0.2 and 0.5

Special versions

Options		
With routine test certificate in German/English	– Z A 1 0	
Size (for specification see the following page)	0	– Z A 0 0
	1	– Z A 0 1
	2	– Z A 0 2
	3	– Z A 0 3
Other special versions on request		

Configuration example

Outdoor support-type current transformer — 4 M E 2

Maximum operating voltage U_m = 24 kV — 4

Rated lightning impulse withstand voltage U_p = 125 kV

Rated short-duration power-frequency withstand voltage U_d = 50 kV — 7 5

Rated short-time thermal current I_{th} = 100 kA — – 1 A

Rated primary current I_{PN} = 1000 A

Thermal strength 300 x I_{PN} — 3

1st core class 10P; instrument security factor 10; rating 60 VA — Q 6

2nd core without — – 0 A

3rd core without — B

Rated secondary current 1st core 5 A; 2nd core without; 3rd core without — 1

Power frequency 50 Hz; marking according to IEC — – Z

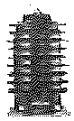
Size 1 — A 0 1

Example for Order No.: 4 M E 2 4 7 5 – 1 A Q 6 3 – 0 A B 1 – Z A 0 1

Order codes: A 0 1

Equipment Selection

4ME2 outdoor support-type current transformer

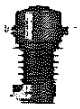


Size specification for 4ME2 transformers

Order No.	Up to 12 kV			At 24 kV		At 36 kV
	with rated short-time thermal current					
	100 x I_{PN}	200 x I_{PN}	300 x I_{PN}	100 x I_{PN}	200 x I_{PN}	100 x I_{PN}
...C1.-0A...	1	1	1	1	1	1
...C2.-0A...	1	1	1	1	1	1
...C3.-0A...	1	1	1	1	1	1
...C4.-0A...	1	1	1	1	1	1
...E2.-0A...	1	1	1	1	1	1
...E3.-0A...	1	1	1	1	1	1
...E4.-0A...	1	1	1	1	1	1
...H3.-0A...	1	1	1	1	1	1
...H4.-0A...	1	1	1	1	1	1
...L3.-0A...	1	1	1	1	1	1
...L4.-0A...	1	1	2	1	1	1
...L6.-0A...	2	2	2	1	2	1
...Q3.-0A...	1	1	1	1	1	1
...Q4.-0A...	1	1	2	1	1	1
...Q6.-0A...	2	2	2	1	2	2
...C2.-4L...	1	2	2	1	2	2
...C3.-4L...	1	1	2	1	2	2
...C4.-6L...	2	2	2	2	2	2
...E2.-4L...	1	1	2	1	2	2
...E3.-4L...	1	1	2	2	2	1
...E4.-4L...	1	2	2	2	2	1
...E4.-6L...	2	2	2	2	2	2
...H3.-4L...	1	2	2	1	2	2
...H4.-4L...	1	2	2	1	2	2
...H4.-6L...	2	2	2	2	2	2
...H3.-4Q...	1	2	2	1	2	2
...H4.-4Q...	1	2	2	1	2	2
...H4.-6Q...	2	2	2	2	2	2
...Y0.-0E...	2	2	2	1	2	2
...Y0.-0F...	2	2	2	2	2	2
...Y0.-0G...	2	2	2	2	2	2
...Y0.-0H...	2	2	2	2	2	2

2

0001124



4ME3 outdoor support-type current transformer

5th position
Operating voltage (maximum value)

Operating voltage U_m kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16	Order codes	
			Order No.: 4 M E 3 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★	■ ■	
12	75	28	4 M E 3 2		See page 60
24	125	50	4 M E 3 4		See page 60
36	170	70	4 M E 3 6		See page 60
52	250	95	4 M E 3 8		See page 60

6th to 9th position
Rated short-time thermal current/ Rated primary current

Rated short-time thermal current I_{th} kA	Rated primary current I_{PN} A	Rated primary current, with primary multiratio I_{PN} A	Thermal strength 300 x I_{PN}	200 x I_{PN}	100 x I_{PN}	6 7 8 9	Order codes	
0.5	2x	5	■		■	0 0 – 3	A	See page 61
0.6	2x	10	■		■	0 1 – 3	B	See page 61
1	2x	5		■		0 3 – 3	A	See page 61
1.5	2x	15	■		■	0 7 – 3	D	See page 61
2.5	2x	25	■		■	1 6 – 3	F	See page 61
3	2x	15		■		1 7 – 3	D	See page 61
5	2x	25		■		2 5 – 3	F	See page 61
5	2x	50	■		■	2 5 – 3	J	See page 61
7.5	2x	75	■	■	■	3 2 – 3	L	See page 61
10	2x	50		■		3 6 – 3	J	See page 61
10	2x	100	■		■	3 6 – 3	M	See page 61
15	2x	75		■		4 3 – 3	L	See page 61
15	2x	150	■		■	4 3 – 3	P	See page 61
20	2x	100		■		4 8 – 3	M	See page 61
20	2x	200	■		■	4 8 – 3	Q	See page 61
25	2x	250	■		■	5 4 – 3	R	See page 61
30	2x	150		■		5 6 – 3	P	See page 61
30	2x	300	■		■	5 6 – 3	S	See page 61
40	2x	200		■		6 3 – 3	Q	See page 61
40	2x	400	■		■	6 3 – 3	T	See page 61
50	2x	250		■		6 7 – 3	R	See page 61
50	2x	500	■		■	6 7 – 3	U	See page 61
60	2x	300		■		7 0 – 3	S	See page 61
60	2x	600	■		■	7 0 – 3	V	See page 61

6th to 9th position continued on page 59

Configuration example
Outdoor support-type current transformer
Maximum operating voltage U_m = 52 kV
Rated lightning impulse withstand voltage U_p = 250 kV
Rated short-duration power-frequency withstand voltage U_d = 95 kV
Rated short-time thermal current I_{th} = 25 kA
Rated primary current I_{PN} = 2x 250 A

Example for Order No.: 4 M E 3 8 5 4 – 3 R
Order codes:

6th to 9th position (continued)
Rated short-time thermal current/ Rated primary current

Rated short-time thermal current I_{th} kA	Rated primary current I_{PN} A	Rated primary current, with primary multiratio I_{PN} A	Thermal strength 300 x I_{PN}	200 x I_{PN}	100 x I_{PN}	Position: 6 7 – 8 9	10 11 12	13 14 15 16	Order codes
						Order No.:	See page 60	See page 60	See page 60	See page 60	See page 60	See page 61	See page 61	See page 61	
0.5	5		■		■	0 0 – 0	A
0.6	10		■		■	0 1 – 0	B
1	5			■		0 3 – 0	A
1.5	15		■		■	0 7 – 0	D
2	10			■		1 3 – 0	B
2	20		■		■	1 3 – 0	E
3	15			■		1 7 – 0	D
3	30		■		■	1 7 – 0	G
4	20			■		2 2 – 0	E
4	40		■		■	2 2 – 0	H
5	50		■		■	2 5 – 0	J
6	30			■		2 6 – 0	G
6	60		■		■	2 6 – 0	K
7.5	75		■		■	3 2 – 0	L
8	40			■		3 3 – 0	H
10	50			■		3 6 – 0	J
10	100		■		■	3 6 – 0	M
12	60			■		3 8 – 0	K
15	75			■		4 3 – 0	L
15	150		■		■	4 3 – 0	P
20	100			■		4 8 – 0	M
20	200		■		■	4 8 – 0	Q
25	250		■		■	5 3 – 0	R
30	150			■		5 6 – 0	P
30	300		■		■	5 6 – 0	S
40	200			■		6 3 – 0	Q
40	400		■		■	6 3 – 0	T
50	250			■		6 7 – 0	R
50	500		■		■	6 7 – 0	U
60	300			■		7 0 – 0	S
60	600		■		■	7 0 – 0	V
80	400			■		7 3 – 0	T
80	800		■		■	7 3 – 0	X
100	500			■		7 5 – 0	U
100	1000		■		■	7 5 – 1	A
120	600			■		7 6 – 0	V
120	1200		■		■	7 6 – 1	B
150	1500				■	7 8 – 1	D
200	2000				■	8 2 – 1	F
250	2500				■	8 4 – 1	G
300	3000				■	8 5 – 1	H

Configuration example
Outdoor support-type current transformer
(U_m = 52 kV, U_p = 250 kV, U_d = 95 kV)
Rated short-time thermal current I_{th} = 100 kA
Rated primary current I_{PN} = 1000 A

	Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes
	Order No.:	4	M	E	3				–						–					–	★	
							8															
								7	5	–	1	A										
Example for Order No.:		4	M	E	3		8	7	5	–	1	A										
Order codes:																						

000125

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength	Position: 10 11 12	Order codes
0.5 0.6 1.5 2 2.5 3 4 5 6 7.5 10 15 20 25 30 40 50 60 80 100 120 150 200 250 300	100 x I_{PN}	0	
1 2 3 4 5 6 8 10 12 15 20 30 40 50 60 80 100 120	200 x I_{PN}	2	
0.5 0.6 1.5 2 2.5 3 4 5 6 7.5 10 15 20 25 30 40 50 60 80 100 120	300 x I_{PN}	3	

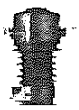
1st core			2nd core			3rd core			Rated primary current I_{PN}				
Class	Factor	VA rating	Class	Factor	VA rating	Class	Factor	VA rating	300 x I_{PN}	200 x I_{PN}	100 x I_{PN}	10 11 12	Order codes
0.2	FS10	5							■	■	■	C 1 – 0 A	
		10							■	■	■	C 2 – 0 A	
		15							■	■	■	C 3 – 0 A	
		30							■	■	■	C 4 – 0 A	
0.5	FS5	10							■	■	■	E 2 – 0 A	
		15							■	■	■	E 3 – 0 A	
		30							■	■	■	E 4 – 0 A	
1	FS5	15							■	■	■	H 3 – 0 A	
		30							■	■	■	H 4 – 0 A	
5P	10	15							■	■	■	L 3 – 0 A	
		30							■	■	■	L 4 – 0 A	
		60							■	■	■	L 6 – 0 A	
10P	10	15							■	■	■	Q 3 – 0 A	
		30							■	■	■	Q 4 – 0 A	
		60							■	■	■	Q 6 – 0 A	
0.2	FS10	10	5P	10	30				■	■	■	C 2 – 4 L	
		15			30				■	■	■	C 3 – 4 L	
		30			60				■	■	■	C 4 – 6 L	
0.5	FS5	10	5P	10	30				■	■	■	E 2 – 4 L	
		15			30				■	■	■	E 3 – 4 L	
		30			30				■	■	■	E 4 – 4 L	
		30			60				■	■	■	E 4 – 6 L	
1	FS5	15	5P	10	30				■	■	■	H 3 – 4 L	
		30			30				■	■	■	H 4 – 4 L	
		30			60				■	■	■	H 4 – 6 L	
1	FS5	15	10P	10	30				■	■	■	H 3 – 4 Q	
		30			30				■	■	■	H 4 – 4 Q	
		30			60				■	■	■	H 4 – 6 Q	
0.2	FS10	15	0.5	FS5	15	5P	10	15	■	■	■	Y 0 – 0 E	
		15			30			30	■	■	■	Y 0 – 0 F	
0.5	FS5	15	5P	10	15	5P	10	15	■	■	■	Y 0 – 0 G	
		15			30			30	■	■	■	Y 0 – 0 H	

■ Feasible (other combinations on request)

Configuration example
Outdoor support-type current transformer
(U_m = 52 kV, I_{th} = 100 kA, I_{PN} = 1000 A)
Thermal strength 300 x I_{PN}
1st core class 10P; instrument security factor 10; rating 60 VA
2nd core without
3rd core without

4 M E 3 8 7 5 – 1 A 3 Q 6 – 0 A

Example for Order No.: 4 M E 3 8 7 5 – 1 A Q 6 3 – 0 A ■ ■
Order codes:



Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes

Order No.: 4 M E 3 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

15th position
Rated secondary current

Rated current for 1st core	Rated current for 2nd core	Rated current for 3rd core	
1 A	Without	Without	0 A A
5 A	Without	Without	0 A B
1 A	1 A	Without	C
5 A	5 A	Without	D
1 A	5 A	Without	E
5 A	1 A	Without	F
1 A	1 A	1 A	G
5 A	5 A	5 A	H

16th position
Additional features

Options	
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval [1]	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

1) Only for class 0.2 and 0.5

Special versions

Optionen	
With routine test certificate in German/English	– Z A 1 0
Other special versions on request	

Configuration example

Outdoor support-type current transformer — 4 M E 3

Maximum operating voltage U_m = 52 kV — B

Rated lightning impulse withstand voltage U_p = 250 kV — 7 5

Rated short-duration power-frequency withstand voltage U_d = 95 kV — –

Rated short-time thermal current I_{th} = 100 kA — 1 A

Rated primary current I_{PN} = 1000 A — 3

Thermal strength 300 x I_{PN}

1st core class 10P; instrument security factor 10; rating 60 VA — Q 6

2nd core **without** — – 0 A

3rd core **without** — B

Rated secondary current 1st core 5 A; 2nd core **without**; 3rd core **without** — 1

Power frequency 50 Hz; marking according to IEC

Example for Order No.: 4 M E 3 B 7 5 – 1 A Q 6 3 – 0 A B 1

Order codes:

000126

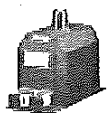
Voltage transformers, type of construction according to IEC [1]

Illustration	Type of design	Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16	Order codes
		Order No.: 4 M ■ ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★	■ ■ ■
 R-HG24-058.eps	Indoor voltage transformer, block-type design, small type of construction according to DIN 42600, single-phase cast-resin insulated, operating voltage up to 12 kV or 24 kV	4 M R 1	Selection from page **63ff**
 R-HG24-059.eps	Indoor voltage transformer, block-type design, small type of construction according to DIN 42600, double-phase cast-resin insulated, operating voltage up to 12 kV or 24 kV	4 M R 2	Selection from page **63ff**
 R-HG24-063.eps	Indoor voltage transformer, block-type design, large type of construction according to DIN 42600, single-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4 M R 5	Selection from page **63ff**
 R-HG24-064.eps	Indoor voltage transformer, block-type design, large type of construction according to DIN 42600, double-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4 M R 6	Selection from page **63ff**
 R-HG24-065.eps	Outdoor voltage transformer, small type of construction, single-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV, 36 kV or 52 kV	4 M S 3	Selection from page **63ff**
 R-HG24-055.eps	Outdoor voltage transformer, small type of construction, double-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV, 36 kV or 52 kV	4 M S 4	Selection from page **63ff**
 R-HG24-066.eps	Outdoor voltage transformer, large type of construction, single-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4 M S 5	Selection from page **63ff**
 R-HG24-067.eps	Outdoor voltage transformer, large type of construction, double-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4 M S 6	Selection from page **63ff**

1) Transformers according to ANSI standard on request

Example for Order No.: 4 M S 3 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■

Order codes:



Maximum operating voltage U_{max} = 52 kV

12 kV

50/60 Hz

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 Order codes

Order No.: 4 M ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ ■ – ★ ■ ■ ■

Maximum operating voltage U_{max} kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated primary voltage U_{prim} kV	Type 4MR1 – single-phase	Type 4MR2 – double-phase	Type 4MR5 – single-phase	Type 4MR6 – double-phase	Type 4MS3 – single-phase	Type 4MS4 – double-phase	Type 4MS5 – single-phase	Type 4MS6 – double-phase	See page 65	See page 65	See page 66	See page 66	See page 67	See page 67	Order codes
12	75	28	3.3/√3	■		■												2 0 8
			3.3		■		■											2 0 8
			3.6/√3	■		■												2 7 0
			3.6		■		■											2 7 0
			4.8/√3	■		■												2 7 1
			4.8		■		■											2 7 1
			5 /√3	■		■		■		■								2 1 3
			5		■		■		■		■							2 1 3
			6 /√3	■		■		■		■								2 1 5
			6		■		■		■		■							2 1 5
			6.6/√3	■		■		■		■								2 1 7
			6.6		■		■		■		■							2 1 7
			7.2/√3	■		■												2 2 2
			7.2		■		■											2 2 2
			10 /√3	■		■		■		■								2 2 7
			10		■		■		■		■							2 2 7
			11 /√3	■		■		■		■								2 3 0
			11		■		■		■		■							2 3 0
			6–10 /√3			■												2 6 1
			6–10				■											2 6 1
			Others	■	■	■	■											2 9 9

Configuration example
Voltage transformer
Outdoor design, single-phase
Rated primary voltage U_{prim} = 6.6/√3 kV

Example for Order No.: 4 M S 3 2 1 7 – ■ ■ ■ ■ ■

Order codes:

000127

24 kV

50/60 Hz

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12						–	★	Order codes		
Order No.:	4	M	■	■	■	■	■	–	■	■	■	■	■						–	★	■	■	■

U_{max} kV	U_p kV	U_d kV	U_{prim} kV	Type 4MR1 – single-phase	Type 4MR2 – double-phase	Type 4MR5 – single-phase	Type 4MR6 – double-phase	Type 4MS3 – single-phase	Type 4MS4 – double-phase	Type 4MS5 – single-phase	Type 4MS6 – double-phase				
24	125	50	13.8/$\sqrt{3}$	■		■		■		■		4	3	5	See page 65
			13.8		■		■		■		■	4	3	5	See page 65
			15 /$\sqrt{3}$	■		■		■		■		4	3	8	See page 66
			15		■		■		■		■	4	3	8	See page 66
			17.5/$\sqrt{3}$	■		■		■		■		4	7	2	See page 67
			17.5		■		■		■		■	4	7	2	See page 67
			20 /$\sqrt{3}$	■		■		■		■		4	4	2	
			20		■		■		■		■	4	4	2	
			22 /$\sqrt{3}$	■		■		■		■		4	4	3	
			22		■		■		■		■	4	4	3	
			10–20 /$\sqrt{3}$	■		■		■		■		4	6	5	
			10–20		■		■		■		■	4	6	5	
			15–20 /$\sqrt{3}$	■		■						4	6	2	
			15–20		■		■					4	6	2	
			Others	■	■	■	■					4	9	9	

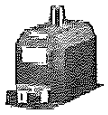
36 kV

50/60 Hz

U_{max} kV	U_p kV	U_d kV	U_{prim} kV	4MR1	4MR2	4MR5	4MR6	4MS3	4MS4	4MS5	4MS6				
36	170	70	20 /$\sqrt{3}$			■						6	4	2	See page 65
			20				■					6	4	2	See page 65
			22 /$\sqrt{3}$			■						6	4	3	See page 66
			22				■					6	4	3	See page 66
			25 /$\sqrt{3}$			■		■		■		6	4	5	See page 67
			25				■		■		■	6	4	5	See page 67
			30 /$\sqrt{3}$			■		■		■		6	4	6	
			30				■		■		■	6	4	6	
			33 /$\sqrt{3}$			■		■		■		6	4	7	
			33				■		■		■	6	4	7	
			35 /$\sqrt{3}$			■		■		■		6	4	8	
			35				■		■		■	6	4	8	
			20–30 /$\sqrt{3}$			■						6	6	4	
			20–30				■					6	6	4	
			Others			■	■					6	9	9	

Configuration example
Voltage transformer
Outdoor design, single-phase
Rated primary voltage U_{prim} = 20/$\sqrt{3}$ kV

Example for Order No.:	4	M	S	3	4	4	2	–	■	■	■	■	■										
Order codes:																							



52 kV

50/60 Hz

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 Order codes

Order No.: 4 M ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ★ ■ ■ ■

Maximum operating voltage U_{max} kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated primary voltage U_{prim} kV	Type 4MR1 – single-phase	Type 4MR2 – double-phase	Type 4MR5 – single-phase	Type 4MR6 – double-phase	Type 4MS3 – single-phase	Type 4MS4 – double-phase	Type 4MS5 – single-phase	Type 4MS6 – double-phase			
52	250	95	$33/\sqrt{3}$					■				8	4	7
			$35/\sqrt{3}$					■				8	4	8
			$40/\sqrt{3}$					■				8	5	0
			$45/\sqrt{3}$					■				8	5	1

See page 66 | See page 66 | See page 67 | See page 67

8th position
Auxiliary residual voltage winding

Voltage V	4MR1	4MR2	4MR5	4MR6	4MS3	4MS4	4MS5	4MS6	
Without auxiliary winding	■	■	■	■	■	■	■	■	0
100/3	■		■		■		■		1
110/3	■		■		■		■		2
120/3	■		■		■		■		3

9th position
Rated secondary voltage

Voltage V	4MR1	4MR2	4MR5	4MR6	4MS3	4MS4	4MS5	4MS6	
$100/\sqrt{3}$	■		■		■		■		A
100		■		■		■		■	A
$110/\sqrt{3}$	■		■		■		■		B
110		■		■		■		■	B
$120/\sqrt{3}$	■		■		■		■		C
120		■		■		■		■	C

Configuration example
Voltage transformer
Outdoor design, single-phase
Rated primary voltage with multi-ratio $U_{prim} = 35/\sqrt{3}$ kV
Without auxiliary residual voltage winding
Rated secondary voltage $U_{sec} = 110$ V

Example for Order No.: 4 M S 3 8 4 8 – 0 B ■ ■ ■
Order codes:

000128

10th/11th position
Rated output of measuring winding and accuracy class

Voltage level U_{max} kV	Class %	Rated output S_N VA	Type 4MR1 – single-phase	Type 4MR2 – double-phase	Type 4MR5 – single-phase	Type 4MR6 – double-phase	Type 4MS3 – single-phase	Type 4MS4 – double-phase	Type 4MS5 – single-phase	Type 4MS6 – double-phase	10th/11th position	See page 67
12	0.2	20	■	■							E	1
	0.2	30			■	■	■	■	■	■	G	1
	0.5	50	■	■							K	2
	0.5	90						■		■	N	2
	0.5	100			■	■	■		■		P	2
	1	100	■	■							P	3
	1	180						■		■	S	3
	1	200			■	■	■		■		T	3
24	0.2	20	■	■							E	1
	0.2	25						■		■	F	1
	0.2	30					■		■		G	1
	0.2	45			■	■					J	1
	0.5	50	■	■							K	2
	0.5	75						■		■	M	2
	0.5	100			■	■	■		■		P	2
	1	100	■	■							P	3
	1	150						■		■	R	3
	1	200			■	■	■		■		T	3
36	0.2	25					■		■		F	1
	0.2	50			■	■					K	1
	0.2	60						■		■	L	1
	0.5	75					■		■		M	2
	0.5	100			■	■					P	2
	0.5	150						■		■	R	2
	1	150					■		■		R	3
	1	200			■	■					T	3
	1	400						■		■	V	3
52	0.2	60					■		■		L	1
	0.5	180					■		■		S	2
	1	400					■		■		V	3

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 … Order codes

Order No.: 4 M ■ ■ ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ … – ★ ■ ■ ■

See page 67

Configuration example
Voltage transformer
Outdoor design, single-phase
Rated output of measuring winding 180 VA
Accuracy class 0.5

4 M S 3 B 4 B – 0 B S 2

Example for Order No.: 4 M S 3 B 4 B – 0 B S 2 ■
Order codes:

12th position
Additional features

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – ★ Order codes
Order No.: 4 M ■ ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ★ ■ ■ ■

Options	4MR1	4MR2	4MR5	4MR6	4MS3	4MS4	4MS5	4MS6	12
50 Hz, VDE marking	■	■	■	■	■	■	■	■	0
50 Hz, IEC marking	■	■	■	■	■	■	■	■	1
50 Hz, VDE marking with approval [1]	■	■	■	■	■	■	■	■	2
60 Hz, IEC marking	■	■	■	■	■	■	■	■	6
Other features on request	■	■	■	■	■	■	■	■	9

1) Only for class 0.2 and 0.5

Additional equipment

Options	Type 4MR1 – single-phase	Type 4MR2 – double-phase	Type 4MR5 – single-phase	Type 4MR6 – double-phase	Type 4MS3 – single-phase	Type 4MS4 – double-phase	Type 4MS5 – single-phase	Type 4MS6 – double-phase	Order codes
With routine test certificate in German/English	■	■	■	■	■	■	■	■	– Z A 1 0

Configuration example
Voltage transformer
Outdoor design, single-phase, cast-resin insulated
Rated primary voltage with multi-ratio $U_{prim} = 35/\sqrt{3}$ kV
Without auxiliary residual voltage winding
Rated secondary voltage $U_{sec} = 110$ V
Rated output of measuring winding 180 VA
Accuracy class 0.5
Additional features 50 Hz, IEC marking
With routine test certificate in German/English

Example for Order No.: 4 M S 3 8 4 8 – 0 B S 2 1 – Z
Order codes: A 1 0

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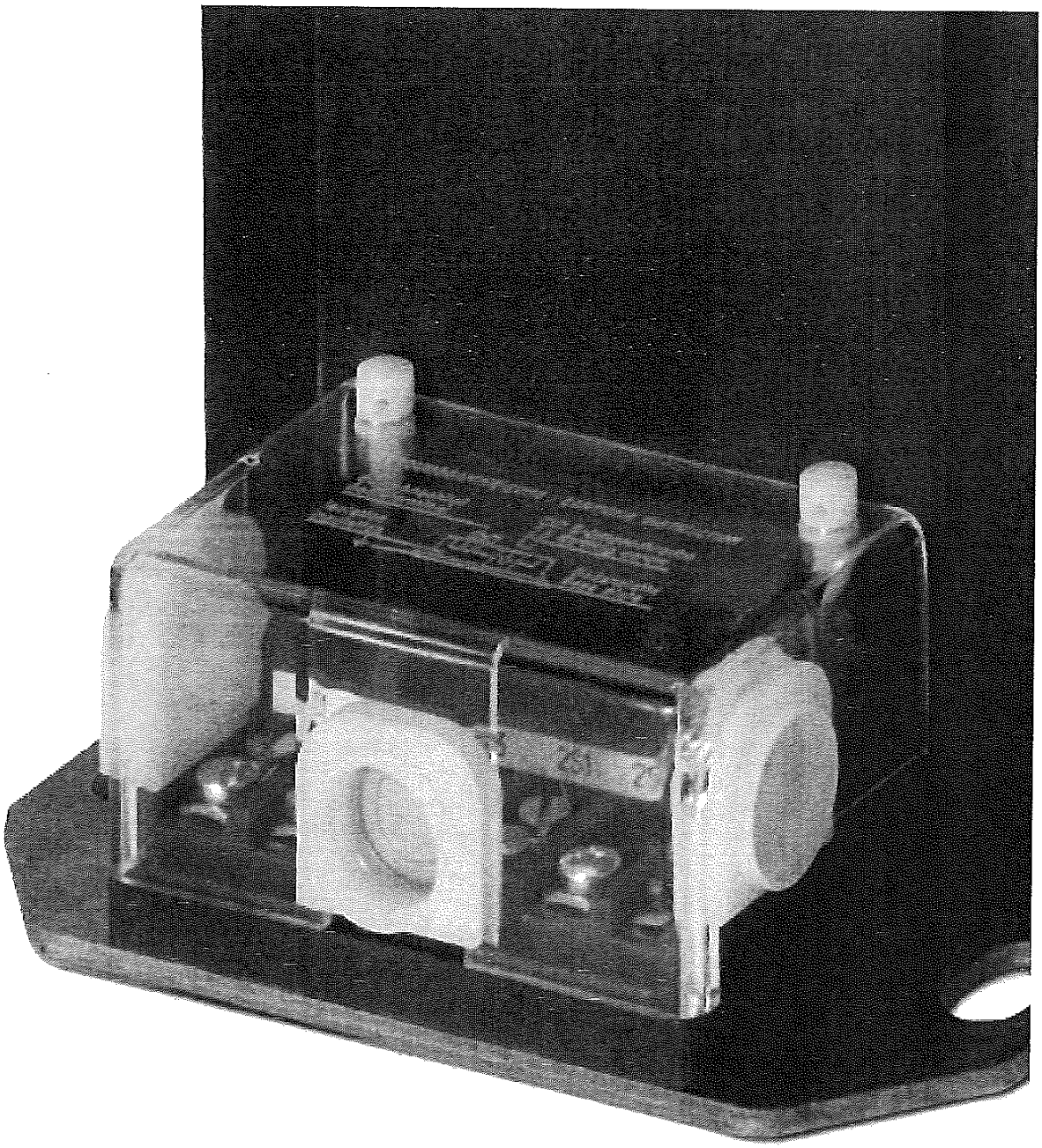

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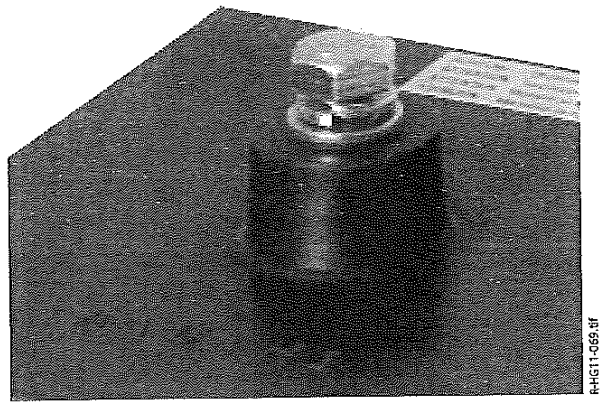

Primary connection terminal of 4MR12 voltage transformer

Contents | Page

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Order No.	Operating voltage (maximum value) U_m	Rated short-duration power-frequency withstand voltage U_d	Rated lightning impulse withstand voltage U_p	Rated frequency	Rated primary current I_{PN}	Multi-ratio	Secondary current I_{SN}	Maximum rated continuous thermal current	Rated short-time thermal current (minimum 100 x I_{PN}) I_{th}	Rated dynamic current (I_{dyn} 2.5 x I_{th}) I_{dyn}	Number of cores	Short-time load (mechanical)	Weight	Catalog dimension drawing
	kV	kV	kV	Hz	A		kA	x I_{PN}	kA	kA	maximum	N	kg	
4MA72	12	28	75	50/60	20 to 2500	2 x 20 to 2 x 600	1/5	1.2	80	120	–	5000	20	1
4MA72...Z F18	17.5	38	95	50/60	20 to 2500	2 x 20 to 2 x 600	1/5	1.2	80	120	–	5000	20	1
4MA74	24	50	125	50/60	20 to 2500	2 x 20 to 2 x 600	1/5	1.2	80	120	–	5000	25	2
4MA76	36	70	170	50/60	20 to 2000	2 x 20 to 2 x 600	1/5	1.2	80	120	–	5000	35	3
4MB12	12	28	75	50/60	1500 to 4000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	3000	19 or 26	4
4MB13	12	28	75	50/60	1500 to 6000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	3000	34	4
4MB14	24[1]	50[1]	125[1]	50/60	1500 to 4000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	3000	26	4
4MC22	12	28	75	50/60	150 to 3000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	5000	12 to 48	5
4MC24	24	50	125	50/60	150 to 3000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	5000	28 to 48	5
4MC26	36	70	170	50/60	150 to 3000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	5000	35 to 48	5
4MC32	12	28	75	50/60	2000 to 10000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	4	5000	32 to 150	6
4MC34	24	50	125	50/60	2000 to 10000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	4	5000	32 to 150	7
4MC36	36	70	170	50/60	2000 to 10000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	4	5000	32 to 150	8
4ME22	12	28	75	50/60	5 to 1200	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	2400	22	9/10
4ME24	24	50	125	50/60	5 to 1200	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	2400	22	9/10
4ME26	36	70	170	50/60	5 to 1200	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	2000	22	11/12
4ME32	12	28	75	50/60	5 to 3000	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	5000	65	13
4ME34	24	50	125	50/60	5 to 3000	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	5000	65	13
4ME36	36	70	170	50/60	5 to 3000	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	5000	65	14
4ME38	52	95	250	50/60	5 to 3000	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	5000	65	15

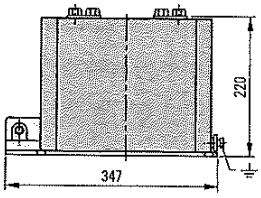
1) Also possible on request: U_m = 17.5, U_d = 38 kV and U_p = 75 kV

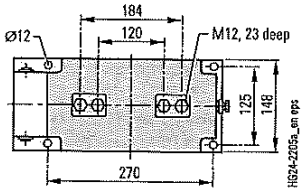
Size specification for 4MC2 transformers

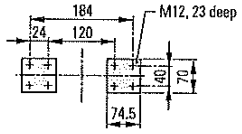
10th to 14th position of Order No.	6th to 9th position of Order No.												
	43-0P	48-0Q	56-0S	63-0T	67-0U	70-0V	73-0X	75-1A	76-1B	78-1D	82-1F	84-1G	86-1H
Sizes of 4MC22 transformers													
C20-0A	1	0	0	0	0	0	0	0	0	0	0	0	21
C30-0A	2	0	0	0	0	0	0	0	0	0	0	0	21
E30-0A	1	0	0	0	0	0	0	0	0	0	0	0	21
E40-0A	2	0	0	0	0	0	0	0	0	0	0	0	21
H30-0A	0	0	0	0	0	0	0	0	0	0	0	0	21
H40-0A	1	2	2	2	2	2	2	2	2	2	2	2	21
Q30-0A	2	1	0	0	0	0	0	0	0	0	0	0	21
Q40-0A	2	1	1	1	0	0	0	0	0	0	0	0	21
Q60-0A	21	3	2	1	1	0	0	0	1	1	1	1	21
C20-4Q	3	2	1	0	0	0	0	0	0	0	0	0	21
C30-4Q	3	2	1	1	0	0	0	0	0	0	0	0	21
E30-3Q	3	2	1	0	0	0	0	0	0	0	0	0	21
E30-4Q	3	2	1	0	0	0	0	0	0	0	0	0	21
E40-4Q	3	2	1	0	0	0	0	0	0	0	0	0	21
E40-6Q	–	21	3	2	2	1	1	1	1	2	2	2	21
H30-3Q	1	1	0	0	0	0	0	0	0	0	0	0	21
H30-4Q	2	2	1	0	0	0	0	0	0	0	0	0	21
H40-4Q	2	2	1	0	0	0	0	0	0	0	0	0	21
H40-6Q	–	21	2	2	1	1	1	1	1	2	2	2	21
Sizes of 4MC24 transformers													
C20-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
C30-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
E30-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
E40-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
H30-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
H40-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
Q30-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
Q40-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
Q60-0A	11	2	1	1	1	1	1	1	1	1	1	11	11
C20-4Q	2	1	1	1	1	1	1	1	1	1	1	11	11
C30-4Q	2	1	1	1	1	1	1	1	1	1	1	11	11
E30-3Q	2	2	1	1	1	1	1	1	1	1	1	11	11
E30-4Q	2	2	1	1	1	1	1	1	1	1	1	11	11
E40-4Q	2	2	1	1	1	1	1	1	1	1	1	11	11
E40-6Q	–	11	2	1	1	1	1	1	1	1	1	11	11
H30-3Q	1	1	1	1	1	1	1	1	1	1	1	11	11
H30-4Q	1	1	1	1	1	1	1	1	1	1	1	11	11
H40-4Q	2	1	1	1	1	1	1	1	1	1	1	11	11
H40-6Q	–	11	2	1	1	1	1	1	1	1	1	11	11
Sizes of 4MC26 transformers													
C20-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
C30-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
E30-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
E40-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
H30-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
H40-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
Q30-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
Q40-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
Q60-0A	–	01	1	1	1	1	1	1	1	1	01	01	01
C20-4Q	01	1	1	1	1	1	1	1	1	1	01	01	01
C30-4Q	01	1	1	1	1	1	1	1	1	1	01	01	01
E30-3Q	01	1	1	1	1	1	1	1	1	1	01	01	01
E30-4Q	01	1	1	1	1	1	1	1	1	1	01	01	01
E40-4Q	01	1	1	1	1	1	1	1	1	1	01	01	01
E40-6Q	–	–	1	1	1	1	1	1	1	1	01	01	01
H30-3Q	1	1	1	1	1	1	1	1	1	1	01	01	01
H30-4Q	1	1	1	1	1	1	1	1	1	1	01	01	01
H40-4Q	01	1	1	1	1	1	1	1	1	1	01	01	01
H40-6Q	–	–	1	1	1	1	1	1	1	1	01	01	01

000131

Dimension drawings for current transformers

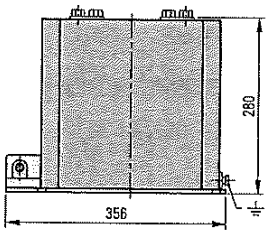


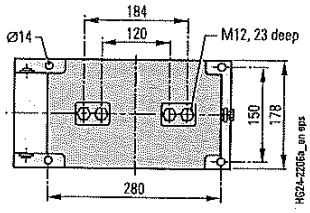


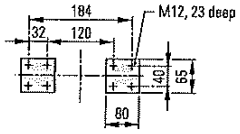


Primary connection ≥ 1500 A

Dimension drawing 1

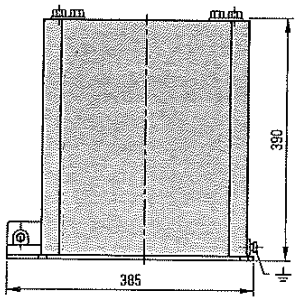


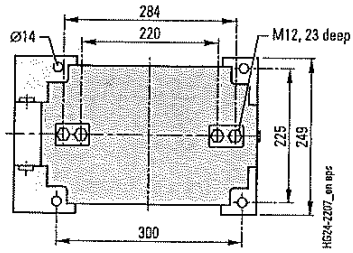


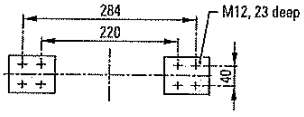


Dimension drawing 2

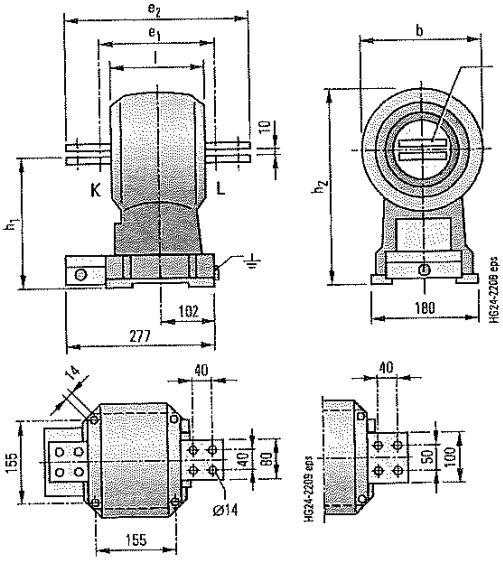
3







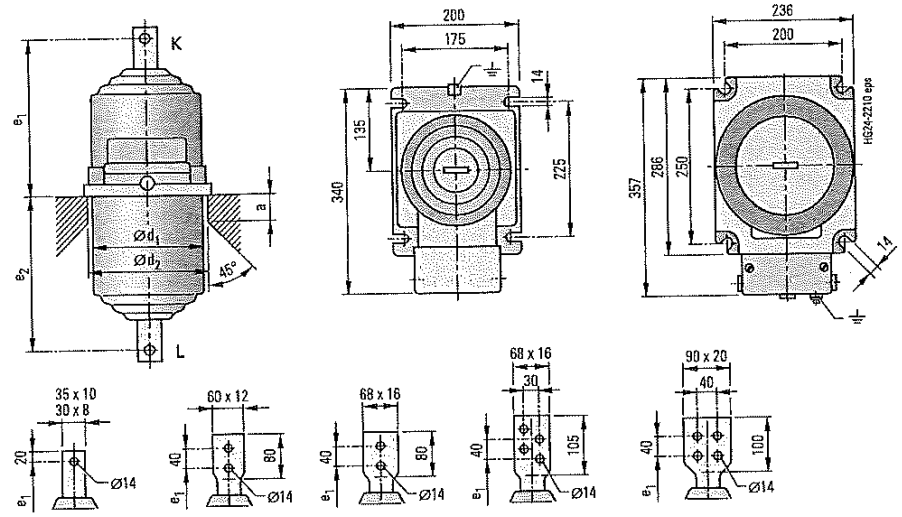
Dimension drawing 3



Type	b	e_1	e_2	h_1	h_2	l
4MB12, size 1	214	210	350	235	342	176
4MB12, size 2	260	230	350	295	425	196
4MB13	273	–	–	288	425	300
4MB14	260	230	350	295	425	196

Current ratings	Bars
Up to 1500 A	2 x 50 x 10
1500 A to 2500 A	2 x 80 x 10
2500 A to 3000 A	2 x 80 x 10 or 3 x 80 x 10
3000 A to 4000 A	3 x 80 x 10 or 3 x 100 x 10

Dimension drawing 4

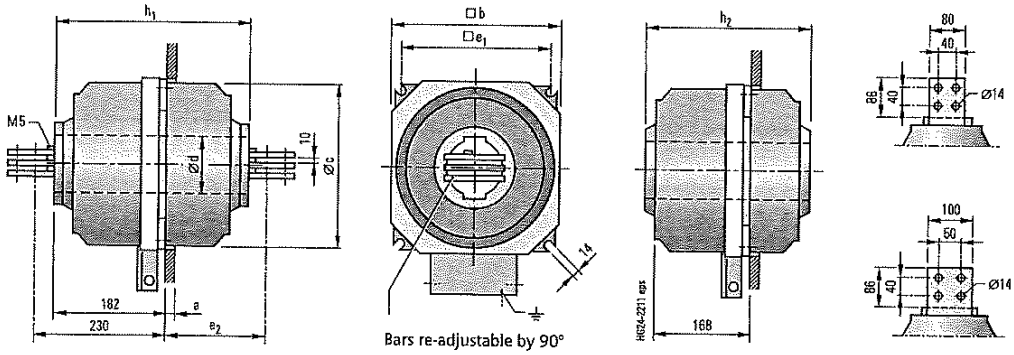


Dimension drawing 5

Type	Size	a max. mm	d_1 mm	d_2 mm	e_1 up to 1500 A mm	e_1 2000 A mm	e_1 up to 3000 A[1] mm	e_2 up to 1500 A mm	e_2 2000 A mm	e_2 up to 3000 A[1] mm	Weight approx. kg
4MC22	0	50	180	185	190	195	215	150	155	175	12 to 18
	1	60	180	185	190	195	215	210	215	235	16 to 22
	2	115	180	185	255	260	280	270	275	295	28 to 32
	3	195	180	185	315	320	340	330	335	355	35 to 40
	21	150	230	235	280	285	315	290	295	325	40 to 48
4MC24	1	60	180	185	255	260	280	270	275	295	28 to 32
	2	140	180	185	315	320	340	330	335	355	35 to 40
	11	100	230	235	280	285	315	290	295	325	40 to 48
4MC26	1	60	180	185	315	320	340	330	335	355	35 to 40
	01	50	230	253	280	285	315	290	295	325	40 to 48

1) Design for rated primary current 3000 A only available in size 21, 11 or 01

000132



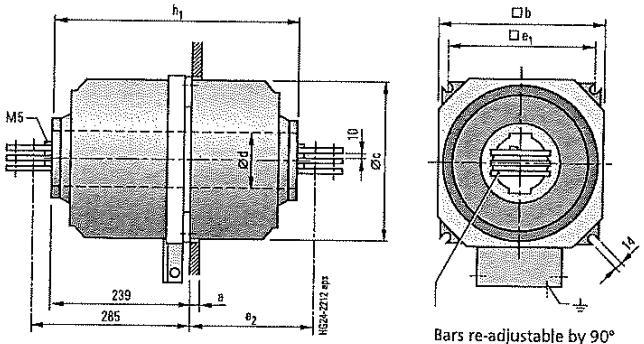
Dimension drawing 6

Size	a_{max}	b	Ø c	Ø d	e_1	e_2	h_1	h_2
11	10	295	278	115	255	175	313	285
12	60	295	278	115	255	250	288	360
21	10	370	356	115	325	175	313	285
22	60	370	356	115	325	250	288	360
31	10	370	356	155	325	–	–	285
32	60	370	356	155	325	–	–	360
41	10	440	440	205	490	–	–	285
42	60	440	440	205	490	–	–	360
51	10	530	530	297	490	–	–	285
52	60	530	530	297	490	–	–	360
61	10	530	530	310	490	–	–	–
62	60	530	530	310	490	–	–	–
72	10	650	650	380	600	–	–	–
73	60	650	650	380	600	–	–	–

Conductor bars

Normal designs

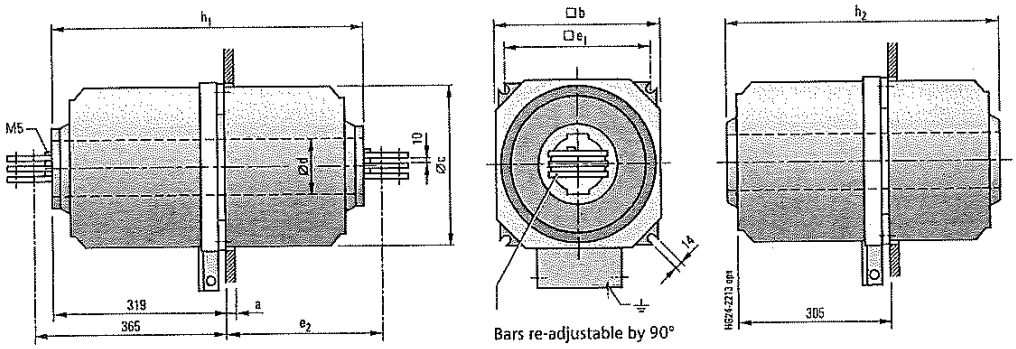
2000 A: 2 bars, 80 x 10 mm
2500 A: 2 bars, 100 x 10 mm
3000 A: 3 bars, 80 x 10 mm
4000 A: 3 bars, 100 x 10 mm



Dimension drawing 7

Size	a_{max}	b	Ø c	Ø d	e_1	e_2	h_1	h_2
11	10	295	278	115	255	230	427	399
12	60	295	278	115	255	305	502	474
21	10	370	356	115	325	230	427	399
22	60	370	356	115	325	305	50	474
31	10	370	356	155	325	–	–	399
32	60	370	356	155	325	–	–	474
41	10	440	440	205	490	–	–	399
42	60	440	440	205	490	–	–	474
51	10	530	530	297	490	–	–	399
52	60	530	530	297	490	–	–	474
61	10	530	530	310	490	–	–	399
62	60	530	530	310	490	–	–	474
72	10	650	650	380	600	–	–	–
73	60	650	650	380	600	–	–	–

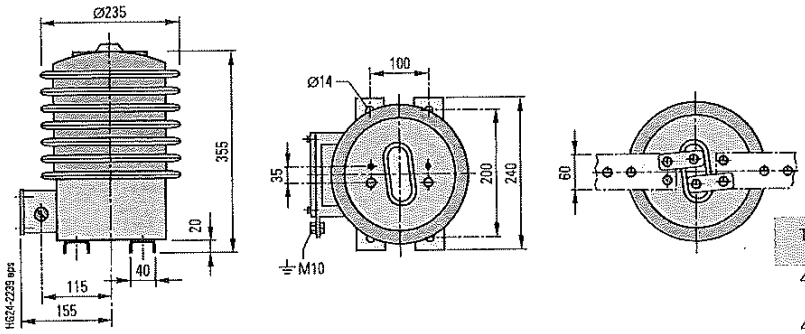
3



Dimension drawing 8

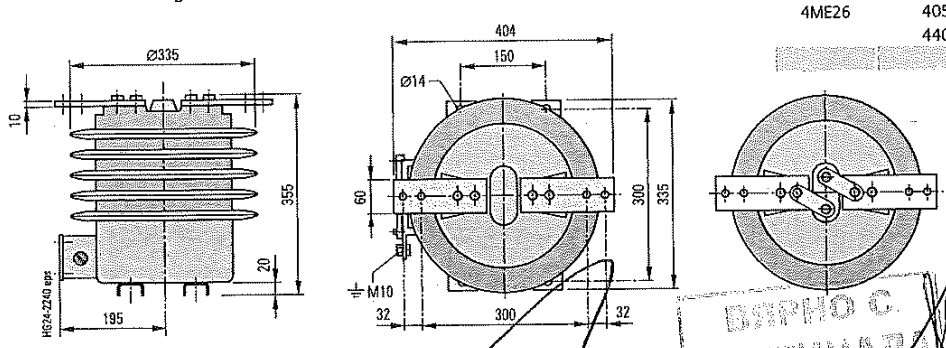
Size	a_{max}	b	Ø c	Ø d	e_1	e_2	h_1	h_2
11	10	295	278	115	255	175	313	285
12	60	295	278	115	255	250	288	360
21	10	370	356	115	325	175	313	285
22	60	370	356	115	325	250	288	360
31	10	370	356	155	325	–	–	285
32	60	370	356	155	325	–	–	360
41	10	440	440	205	490	–	–	285
42	60	440	440	205	490	–	–	360
51	10	530	530	297	490	–	–	285
52	60	530	530	297	490	–	–	360
61	10	530	530	310	490	–	–	–
62	60	530	530	310	490	–	–	–
72	10	650	650	380	600	–	–	–
73	60	650	650	380	600	–	–	–

3



Dimension drawing 9

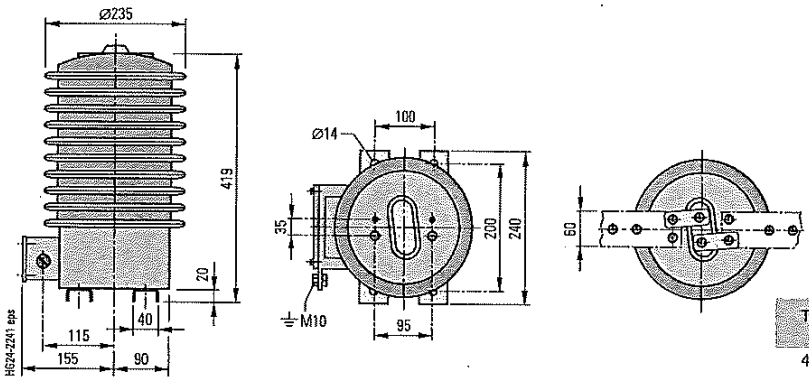
Type	Arcing distance	Creepage distance
4ME22	229	486
	310	400
4ME24	229	486
	440	1010
4ME26	405	945
	440	1010



Dimension drawing 10

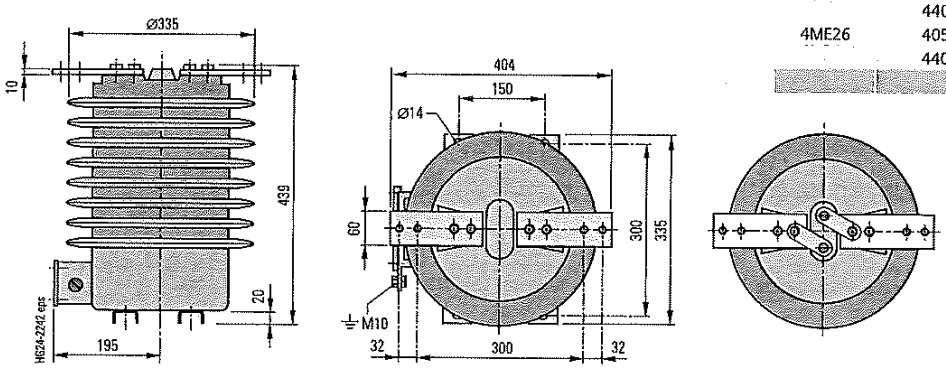
ВЯРНО С ОРИГИНАЛА
СОФИЯ

000133

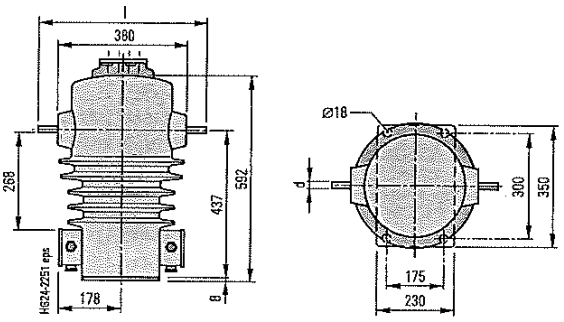


Dimension drawing 11

Type	Arcing distance	Creepage distance
4ME22	229	486
	310	400
4ME24	229	486
	440	1010
4ME26	405	945
	440	1010

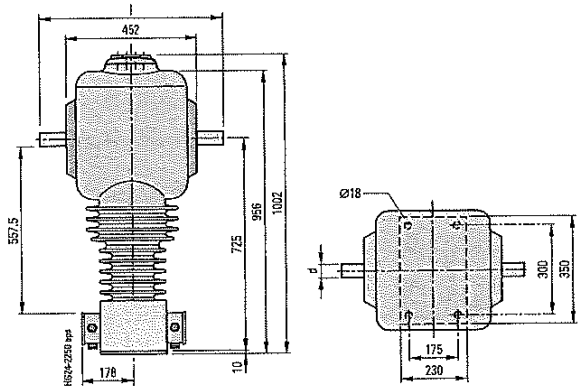


Dimension drawing 12



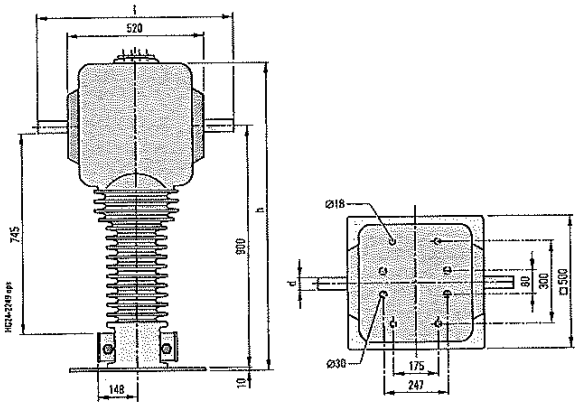
Dimension drawing 13

I_{PN}	d	l	Arcing distance	Creepage distance
Up to 600 A	20	500	268	665
600 to 1250 A	30	560	268	665
1250 to 2000 A	42	600	268	665
2000 to 3000 A	48	620	268	665



Dimension drawing 14

I_{PN}	d	l	Arcing distance	Creepage distance
Up to 600 A	20	572	557.5	1290
600 to 1250 A	30	632	557.5	1290
1250 to 2000 A	42	672	557.5	1290
2000 to 3000 A	48	692	557.5	1290



Dimension drawing 15

I_{PN}	d	l	h	Arcing distance	Creepage distance
500 A	30	700	1125	745	1823
Up to 1250 A	30	700	1188	745	1823
1250 to 2000 A	42	740	1188	745	1823
2000 to 3000 A	45	760	1188	745	1823
2x 600 A	30	700	1217	745	1823

3

Terminal designations of current transformers

Transformer design	Designation of connection terminals acc. to VDE	acc. to IEC	Example for rated current data
1 primary winding	K L	P1 P2	100/1 A
1 secondary winding	k l	S1 S2	
2 equivalent primary windings	Ka Kb La Lb	P1 C1 C2 P2	2 x 100/1 A
1 secondary winding	k l	S1 S2	
with primary multi-ratio			
1 primary winding	K L	P1 P2	1000–800 ... 200/1A
1 secondary winding with tappings	k l3 l2 l1	S1 S2 S3 S4	
with secondary multi-ratio, highest rated current at l1 or S4			
1 primary winding	K L	P1 P2	100/1 A
2 or more secondary windings on separate cores	1k 1l 2k 2l	1S1 1S2 2S1 2S2	

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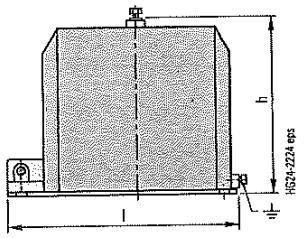
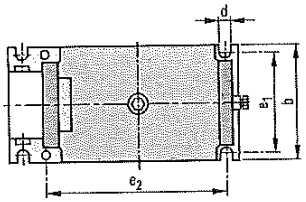
Order No.	Operating voltage (maximum value) U_m	Rated short-duration power-frequency withstand voltage U_d	Rated lightning impulse withstand voltage U_p	Rated frequency	Maximum rated primary voltage U_{PN}	Multi-ratio U_{SN}	Thermal limiting output S_{th}	Rated voltage factor (8h)	Rated thermal limiting output of the residual voltage winding	Short-time load (mechanical)	Weight	Catalog dimension drawing
	kV	kV	kV	Hz	kV	kV	VA		VA/A	N	kg	
4MR12	12	28	75	50/60	$11.5/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	350	1.9	230/4	–	18	16
4MR14	24	50	125	50/60	$22/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	500	1.9	230/4	–	28	16
4MR22	12	28	75	50/60	11.5	100; 110; 120	400	–	–	–	18	17
4MR24	24	50	125	50/60	22	100; 110; 120	400	–	–	–	30	17
4MR52	12	28	75	50/60	$11.5/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	600	1.9	350/6	–	25	18
4MR54	24	50	125	50/60	$22/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	600	1.9	350/6	–	35	18
4MR56	36	70	170	50/60	$35/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	800	1.9	350/6	–	60	18
4MR62	12	28	75	50/60	11.5	100; 110; 120	600	–	–	–	25	19
4MR64	24	50	125	50/60	22	100; 110; 120	600	–	–	–	35	19
4MR66	36	70	170	50/60	35	100; 110; 120	800	–	–	–	70	19
4MS32	12	28	75	50/60	$12/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	400	1.9	230/4	1000	72	20
4MS34	24	50	125	50/60	$22/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	400	1.9	230/4	1000	75	20
4MS36	12	28	75	50/60	$35/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	400	1.9	230/4	1000	79	20
4MS38	52	70	250	50/60	$50/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	800	1.9	500/9	1000	79	20
4MS42	12	28	75	50/60	12	100; 110; 120	500	–	–	1000	73	21
4MS44	24	50	125	50/60	22	100; 110; 120	500	–	–	1000	76	21
4MS46	12	28	75	50/60	35	100; 110; 120	900	–	–	1000	82	21
4MS52	12	28	75	50/60	$12/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	400	1.9	230/4	1000	35.5	22
4MS54	24	50	125	50/60	$22/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	400	1.9	230/4	1000	35.5	22
4MS56	36	28	75	50/60	$35/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	400	1.9	230/4	1000	51	23
4MS62	12	28	75	50/60	12	100; 110; 120	500	–	–	1000	37	24
4MS64	24	50	125	50/60	22	100; 110; 120	500	–	–	1000	37	24
4MS66	36	28	75	50/60	35	100; 110; 120	500	–	–	1000	57	25

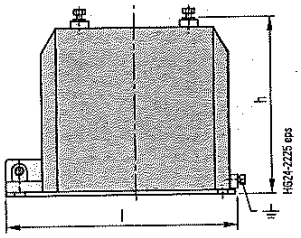
Dimension drawings for voltage transformers

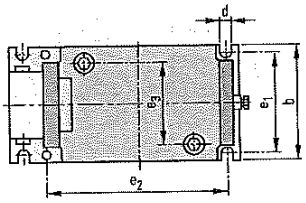




Type	b	h	l	e_1	e_2	d
4MR12	148	220	335	125	270	11
4MR14	178	280	357	150	280	14

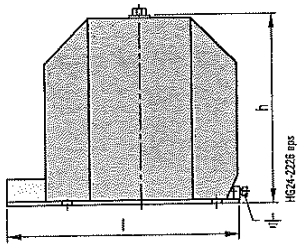
Dimension drawing 16

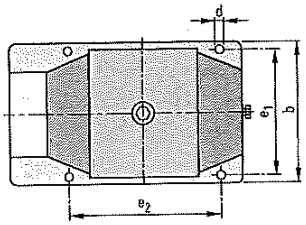




Type	b	h	l	e_1	e_2	e_3	d
4MR12	148	220	335	125	270	110	11
4MR14	178	280	357	150	280	130	14

Dimension drawing 17

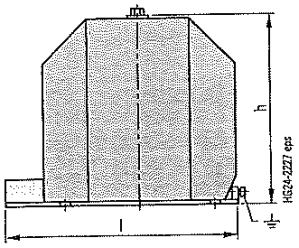


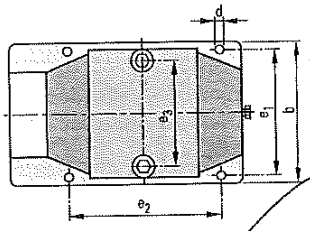


Type	b	h	l	e_1	e_2	d
4MR52	200	240	342	175	225	11
4MR54	225	300	370	200	250	14
4MR54 [1]	200	300	324	175	225	14
4MR56	249	390	395	225	300	14

1) Design on request

Dimension drawing 18





Type	b	h	l	e_1	e_2	e_3	d
4MR62	200	240	342	175	225	150	11
4MR64	225	300	370	200	250	210	14
4MR64 [1]	200	260	324	175	225	155	14
4MR66	249	390	395	225	300	320	14

1) Design on request

Dimension drawing 19

ВЯРНО С ОРИГИНАЛА
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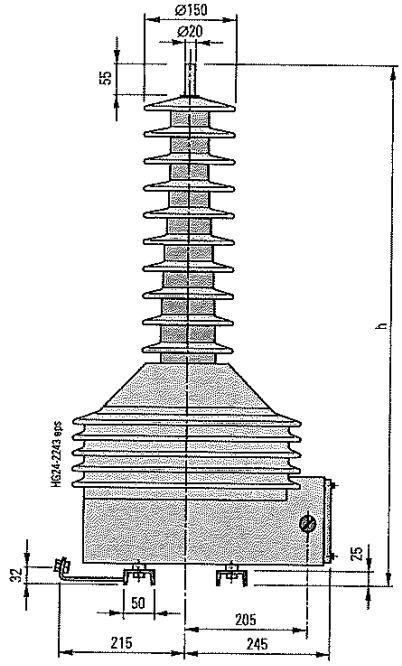
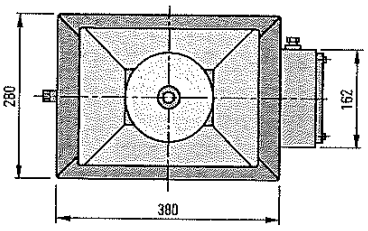
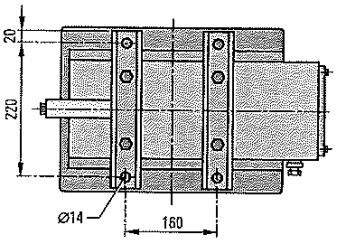


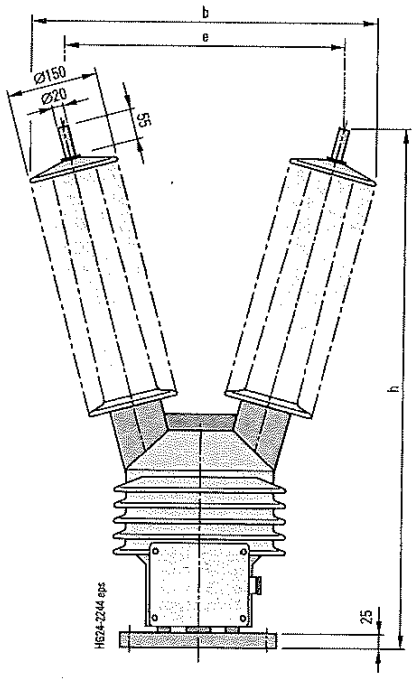




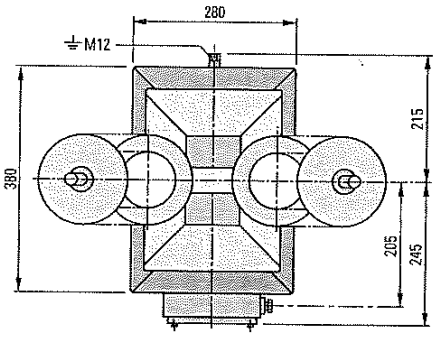
Type	h	Arcing distance	Creepage distance	Number of sheds
4MS32	520	420	790	2
4MS34	655	550	1055	5
4MS36	880	760	1615	10
4MS38	880	760	1615	10

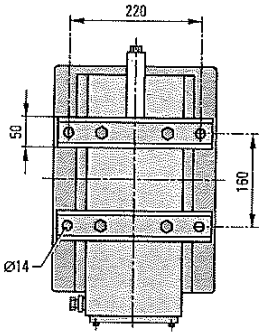
Dimension drawing 20

3

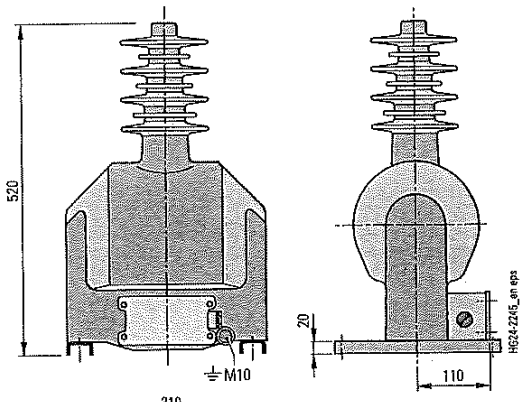


Type	h	b	e	Arcing distance	Creepage distance	Number of sheds
4MS42	515	375	270	420	760	2 x 2
4MS44	645	445	340	550	1035	2 x 5
4MS46	865	560	455	760	1595	2 x 10

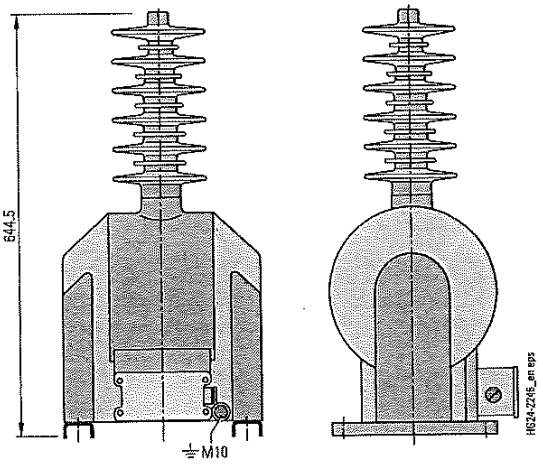




Dimension drawing 21

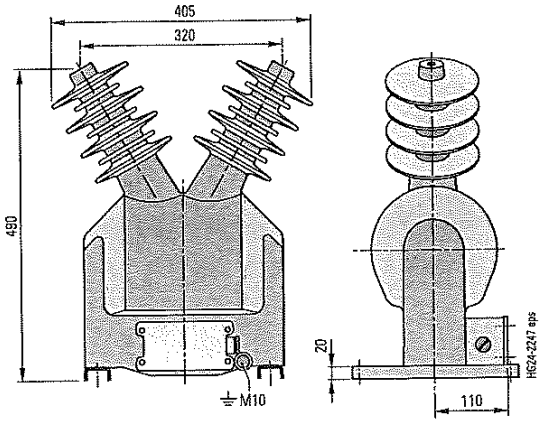


Dimension drawing 22

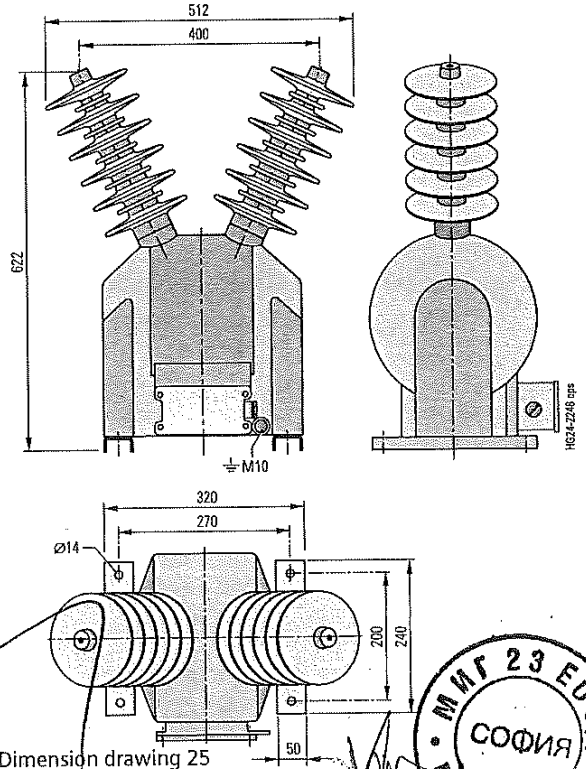


Dimension drawing 23

3



Dimension drawing 24



Dimension drawing 25

ВЯРНО С ОРИГИНАЛА

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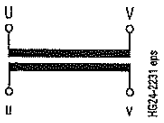
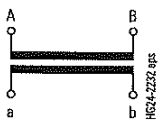
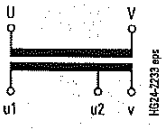
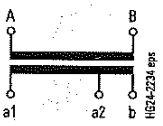
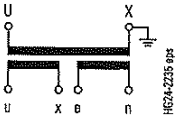
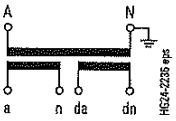
Terminal designations of the voltage transformers

Transformer design	Designation of the connection terminals acc. to VDE	Designation of the connection terminals acc. to IEC	Example for low-voltage data
Unearthed 1 secondary winding			10000/100 V
Unearthed 1 secondary winding with tappings			5000–10000/100 V
	highest rated voltage at u1 or a1		
Earthed 1 measuring winding 1 auxiliary residual voltage winding			10000/$\sqrt{3}$ / 100/$\sqrt{3}$ / 100/3 V

3

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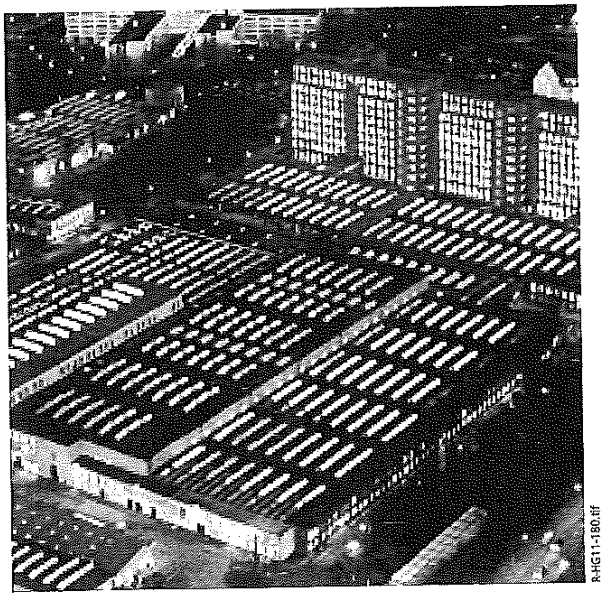

Switchgear Factory Berlin, Germany

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ВЯРНО С ОРИГИНАЛА

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000137

Please copy, fill in and return to your Siemens partner.

Inquiry concerning

- ☐ 4MA7 current transformer
- ☐ 4MB1 current transformer
- ☐ 4MC2 current transformer
- ☐ 4MC3 current transformer
- ☐ 4ME2 current transformer
- ☐ 4ME3 current transformer
- ☐ 4MR voltage transformer
- ☐ 4MS voltage transformer

Please

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Dept.

Name

Street

Postal code/city

Phone

Fax

E-mail

Siemens AG

Dept.

Name

Street

Postal code/city

Fax

Technical data of current transformer

				Other values
Operating voltage	☐ 12 kV ☐ 36 kV	☐ 17.5 kV ☐ 52 kV	☐ 24 kV	☐ ___ kV
Rated lightning impulse withstand voltage	☐ 75 kV ☐ 170 kV	☐ 95 kV ☐ 250 kV	☐ 125 kV	☐ ___ kV
Rated short-duration power-frequency withstand voltage	☐ 28 kV ☐ 70 kV	☐ 38 kV ☐ 95 kV	☐ 50 kV	☐ ___ kV
Rated primary current	☐ ___ A	☐ 2x___ A		
Secondary current	☐ 1 A	☐ 5 A		
Thermal strength	☐ 100 x I_{PN} ☐ 300 x I_{PN} ☐ 600 x I_{PN}	☐ 150 x I_{PN} ☐ 400 x I_{PN} ☐ 800 x I_{PN}	☐ 200 x I_{PN} ☐ 500 x I_{PN} ☐ 1000 x I_{PN}	☐ ___ x I_{PN}
1st core	☐ Protection core ☐ Measuring core	☐ ___ Class ☐ ___ Class	☐ ___ Factor ☐ ___ Factor	☐ ___ VA ☐ ___ VA
2nd core	☐ Protection core ☐ Measuring core	☐ ___ Class ☐ ___ Class	☐ ___ Factor ☐ ___ Factor	☐ ___ VA ☐ ___ VA
3rd core	☐ Protection core ☐ Measuring core	☐ ___ Class ☐ ___ Class	☐ ___ Factor ☐ ___ Factor	☐ ___ VA ☐ ___ VA

Technical data of voltage transformer

				Other values
Maximum operating voltage	☐ 12 kV ☐ 36 kV	☐ 24 kV ☐ 52 kV		☐ ___ kV
Rated lightning impulse withstand voltage	☐ 75 kV ☐ 170 kV	☐ 95 kV ☐ 250 kV	☐ 125 kV	☐ ___ kV
Rated short-duration power-frequency withstand voltage	☐ 28 kV ☐ 70 kV	☐ 38 kV ☐ 95 kV	☐ 50 kV	☐ ___ kV
Rated primary voltage	☐ ___ kV	☐ ___/$\sqrt{3}$		
Rated secondary voltage	☐ 100 V ☐ 100/$\sqrt{3}$ V	☐ 110 V ☐ 110/$\sqrt{3}$ V	☐ 120 V ☐ 120/$\sqrt{3}$ V	☐ ___ V ☐ ___/$\sqrt{3}$ V
Auxiliary residual voltage winding	☐ Without	☐ 100/3 V	☐ 110/3 V	☐ 120/3 V
Rated output of the measuring winding	☐ Class 0.2 ☐ 20 VA	☐ Class 0.5 ☐ 50 VA	☐ Class 1 ☐ 100 VA	☐ ___ VA

Application and other requirements

☐ Please check off

___ Please fill in

You prefer to configure your instrument t[illegible]mer on your own?

Please follow the steps for configuration and enter th[illegible]der number in the configuration aid.

For configuration of your
4M protective and measuring transformers

Instruction for configuration of the 4M protective and measuring transformers

1st step: Definition of the current transformer

Please specify the following ratings:	Possible options:
Transformer design	Block-type transformer, bushing-type transformer, outdoor transformer, etc.
Operating voltage (U_m)	U_m: 12 kV to 52 kV
Rated lightning impulse withstand voltage (U_p)	U_p: 75 kV to 250 kV
Rated short-duration power-frequency withstand voltage (U_d)	U_d: 28 kV to 95 kV
Rated primary current (I_{PN})	I_{PN}: 20 A to 10000 A
Secondary current (I_{SN})	I_{SN}: 1 A or 5 A
Thermal strength	100 x I_{PN} to 1000 I_{PN}
Core data	Quantity, type, class, factor and rating of cores

These ratings define the positions 3 to 15 of the order number of the current transformer.

2nd step: Definition of the voltage transformer

Please specify the following ratings:	Possible options:
Transformer design	Block-type transformer, outdoor transformer
Number of phases	Single-phase or double-phase
Operating voltage (U_m)	U_m: 12 kV to 52 kV
Rated lightning impulse withstand voltage (U_p)	U_p: 75 kV to 250 kV
Rated short-duration power-frequency withstand voltage (U_d)	U_d: 28 kV to 95 kV
Rated primary voltage (U_{PN})	U_{PN}: 3.3 kV to 45 kV or values divided by $\sqrt{3}$
Rated secondary voltage (U_{SN})	U_{SN}: 100 V, 110 V, 120 V or values divided by $\sqrt{3}$
Rated output of the measuring winding	25 VA, class 0.2 up to 400 VA, class 1

These ratings define the positions 3 to 11 of the order number of the voltage transformer.

3rd step: Do you have any further requirements concerning the equipment?

Should you still need more options than the possible equipment like terminal designations according to VDE or IEC, selection of sizes, routine test certificate, etc., please contact your responsible sales partner.

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МИГ 23 ЕООД СОФИЯ MIG 23 LTD
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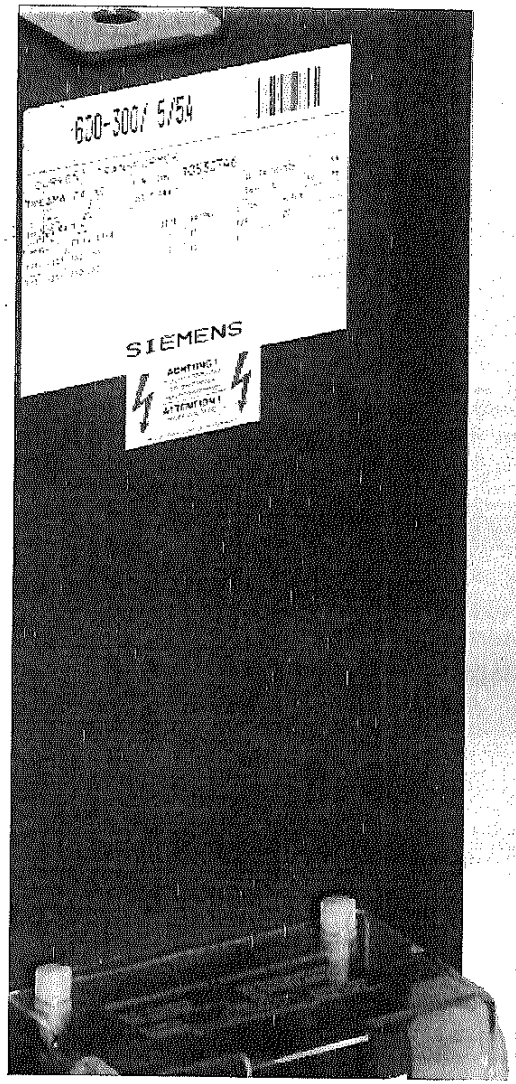

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Siemens AG
Energy Sector
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E-mail: support.energy@siemens.com

Order No. E50001-K1524-A101-A3-7600
Printed in Germany
Dispo 31601, c4bs 7460
KG 05.09 2.0 88 En
6101/15477 480488

Printed on elementary chlorine-free bleached paper.

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General editing:
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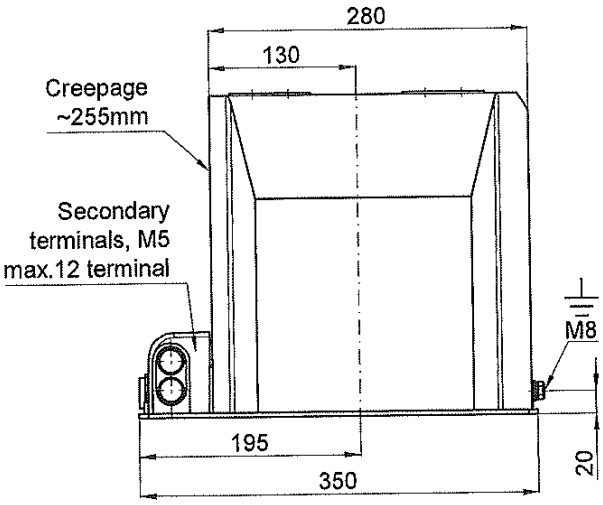
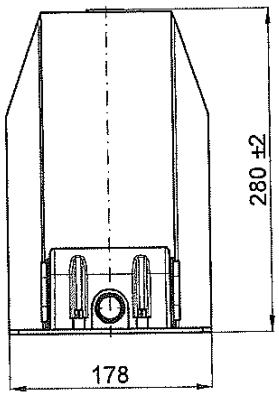
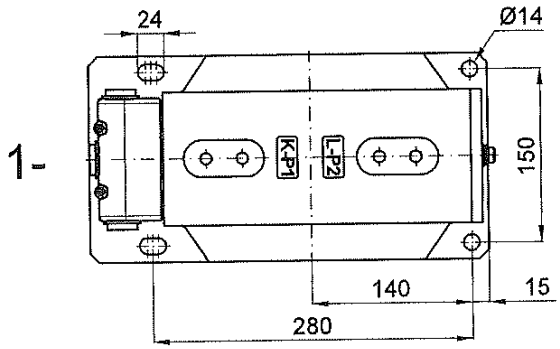
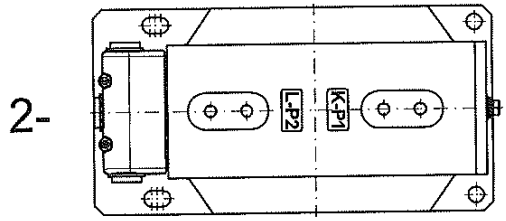
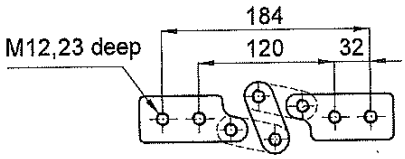




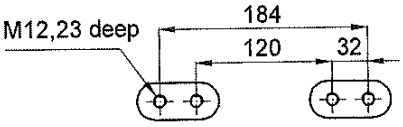




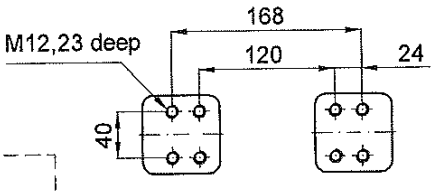
PRIMARY CONNECTION TERMINALS



In ≤ 2x600A

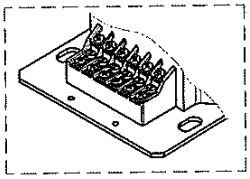


up to 600A (Brass)
600A<In<1500A (ECu)



1500A ≤ In ≤ 4000A

Screw	Tightening Torque Nm
M5	4
M8	16-20
M12	60-70



Secondary terminal's detail

DEĞİŞİKLİK
TEKNİK BÜRO
Tarih 01 / 06 / 2016

QTY	DESCRIPTION	POS	DIMENSIONS	WEIGHT	PART OR DIN NO.	MATERIAL

NO	DATE	NAME	MODIFICATION
L	01-03-16	Arzu	Design was changed.

PLATE CODE	3012375
BOX CODE	3009583
REV.	L

TOLERANS DIN ISO 2768-1 (c)

SCALE -/-

4MA74
CURRENT TRANSFORMER

SIEMENS

REPLACES THE DRAWING NO.

DR'N
CH'D
APP'D
C.C MT

ВЯРНО С ОРИГИНАЛА

ALCE

OG Ölçü Trafo

000130

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ДОКУМЕНТ 2.2

РЕПУБЛИКА БЪЛГАРИЯ
Български институт по метрология

REPUBLIC OF BULGARIA
Bulgarian Institute of Metrology

ДОПЪЛНЕНИЕ № 17.01.5109.1

КЪМ УДОСТОВЕРЕНИЕ
ЗА ОДОБРЕН ТИП СРЕДСТВО ЗА ИЗМЕРВАНЕ № 16.11.5109
Measuring Instrument Type-approval Certificate-Revision 1

Издадено на производител: *Issued to manufacturer:*	SIEMENS AG - Germany Wittelsbacherplatz 2, D-80333 Munich, Germany
На основание на: *In Accordance with:*	Чл. 32, ал.1 от Закона за измерванията
Относно: *In Respect of:*	измервателни токови трансформатори тип 4MAxx
Технически и метрологични характеристики: *Technical and metrological characteristics:*	приложение, неразделна част от настоящото удостоверение за одобрен тип средство за измерване
Срок на валидност: *Valid until:*	15.11.2026 г.
Средството за измерване е вписано в регистъра на одобрените за използване типове средства за измерване под №: *Reference №:*	5109
Дата на издаване на допълнението към удостоверението за одобрен тип: *Date:*	05.01.2017 г.

И.Д. ПРЕД

На основание чл.36а ал.3 от ЗОП

ВЯРНО С ОРИГИНАЛА

МИГ 23 ЕООД СОФИЯ MIG 23 LTD

000140

Приложение към Допълнение № 17.01.5109.1 към удостоверение № 16.11.5109

Издадено на производител: SIEMENS AG - Germany
Wittelsbacherplatz 2, D-80333 Munich, Germany

Относно: измервателни токови трансформатори тип 4MAxx

Описание на допълнение № 17.01.5109.1 към удостоверение за одобрен тип № 16.11.5109:

Към т.2 **Технически и метрологични характеристики** се добавя към **Мощност, VA/клас на точност:** от 5 до 15/0,2S; 0,2

Таблицата от т.2 Технически и метрологични характеристики добива вида:

Характеристика	**Трансформатор тип 4MAxx**		
	4MA72	**4MA74**	**4MA76**
Максимално работно напрежение, kV	до 12	до 24	до 36
Номинален първичен ток, A	до 4000		
Номинален вторичен ток, A	1 и 5		
Честота, Hz	50		
Клас на точност **- измервателна намотка** **- защитна намотка**	0,2S; 0,2; 0,5S; 0,5; 1 5P10; 10P10		
Мощност, VA/клас на точност	от 5 до 15/0,2S; 0,2 от 5 до 30/0,5S; 0,5; 1 от 5 до 30/5P10; 10P10		

ВЯРНО С ОРИГИНАЛА

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000141

ДОКУМЕНТ 2.3

INSTITUT „PRÜFFELD FÜR ELEKTRISCHE HOCHLEISTUNGSTECHNIK" GMBH
IPH BERLIN

Independent, accredited test laboratory · Registration with STLA and LOVAG

TYPE TEST REPORT

NO. 1416.0077.3.032

Siemens Sanayi ve Tic. A. Ş. Power Transmission and Distribution (PTD) Yakacik Yolu No: 111 81430 Kartal-ISTANBUL (TURKEY)	CLIENT
ALCE Elektrik Sanayi ve Ticaret A. Ş.	MANUFACTURER
Block-type current transformer	TEST OBJECT
4MA74	TYPE
03/00811	MANUFACTURING NO.

RATED CHARACTERISTICS GIVEN BY THE CLIENT

Rated primary current	1250 A
Rated secondary current	5 - 5 A
Rated frequency	50 - 60 Hz
Rated output	15 - 15 VA
Accuracy class	0.5FS5 - 5P10
Highest voltage for equipment	24 kV
Rated power-frequency withstand voltage	50 kV
Rated lightning impulse withstand voltage	125 kV
Rated short-time thermal current (I_{th}) 3 s	31.5 kA
Rated dynamic current (I_{dyn})	80 kA

IEC 60044-1: 1996-12, mod. + am1: 2000-07 STL Guide to the interpretation of IEC 60044-1 1st Edition 1996-12	NORMATIVE DOCUMENT

RANGE OF TESTS PERFORMED

- Impulse tests on the primary winding
- Determination of errors
- Short-time current test
- Temperature-rise test

24 February to 7 March 2003	DATE OF TEST
The test object has PASSED the above-mentioned type tests performed at 50 Hz	TEST RESULT

На основание чл.36а ал.3 от ЗОП

Berlin, 15 August 2003

ВЯРНО С ОРИГИНАЛА

МИГ 23 ЕООД СОФИЯ МИГ 23 LTD

Independent test laboratory, accredited by Deutsche Akkreditierungsstelle Technik (DATech) e.V. in the fields of h.v. apparatus and switchgear, power cables and power cable accessories, l.v. apparatus and switchgear, installation equipment and switching and control equipment

Deutscher Akkreditierungs Rat
DAR
DAT - P - 019/92

Contents **Sheet**

This test document consists of 30 sheets.

Distribution Copy No.: 1

Copies Nos. 1 and 2 in English: ALCE Elektrik Sanayi ve Ticaret A. Ş.

The test results relate only to the object tested.
This document is confidential. Its transfer to third parties as well as its reproduction in extracts require the consent of the client.

ВЯРНО С ОРИГИНАЛА

МИГ 23 БГ СОФИЯ MIG 23 LT

000143

1. Present at the test

Mr.	Moritz	IPH test engineer in charge
Mrs.	Hauschild	IPH test engineer
Mr.	Vogler	IPH test engineer
Mr.	Wittwer	IPH test engineer
Mr.	Çiftçioğlu	ALCE Elektrik Sanayi ve Ticaret A. Ş.

2. Test performed

- Lightning impulse test on the primary winding
- Determination of errors
- Short-time current test
- Temperature-rise test

3. Identity of the test object

3.1 Technical data and characteristics

The technical data and characteristics of the test object are defined by the following parameters and specified by the client.

Test object:	Block-type current transformer		
Type:	4MA74		
Manufacturer:	ALCE Elektrik Sanayi ve Ticaret A. Ş.		
Serial No.:	03/00811		
Year of manufacture:	2003		
Data:	Rated primary current (I_n)		1250 A
	Rated continuous thermal current (I_{cont})		1.2 x I_n
	Rated secondary current	core 1	5 A
		core 2	5 A
	Rated frequency		50 - 60 Hz
	Rated output	core 1	15 VA
		core 2	15 VA
	Accuracy class	core 1	0.5FS5
		core 2	5P10
	Rated dynamic current (I_{dyn})		80 kA
	Rated short-time thermal current (I_{th})		31.5 kA
	Duration of short-circuit		3 s
	Rated insulation level		
	Highest voltage for equipment (U_m)		24 kV
	Rated power-frequency withstand voltage		50 kV
	Rated lightning impulse withstand voltage (list 2)		125 kV
	Insulating material class		E
Characteristics:	Winding material	Primary winding	Cu
		Secondary winding, core 1	Cu
		Secondary winding, core 2	Cu
	Cross-section of windings	Primary winding	690 mm²
		Secondary winding, core 1	2.55 mm²
		Secondary winding, core 2	2.54 mm²

3.2 Identity documents

The manufacturer confirms that the test object has been manufactured in compliance with the drawings given in this document. IPH did not verify this compliance in detail.
The identity of the test object is fixed by the following drawings and data submitted by the client:

Name of drawing	Drawing No.	Date of drawing	Author	Notes
4MA74 BLOCK-TYPE CURRENT TRANSFORMER	416	06.02.03	ALCE	Sheet 30

Entry of test object at IPH: 13 February 2003

ВЯРНО С ОРИГИНАЛА

MIG 23 ECS СОФИЯ MIG 23 LTS

000144

4. Impulse test on the primary winding

4.1 Test laboratory

High-voltage test laboratory, high-voltage hall 2

4.2 Normative document

IEC 60044-1: 1996-12, mod. + am1: 2000-07, Sub-clause 7.3.2

4.3 Required test parameters

Lightning impulse voltage 1.2/50 µs	125 kV	Peak value
Polarity		Positive and negative
Impulse sequence	1 impulse	Full wave at approx. 50 % of test voltage (reference impulse)
	15 impulses	Full wave at 100 % of test voltage
Atmospheric correction		Without

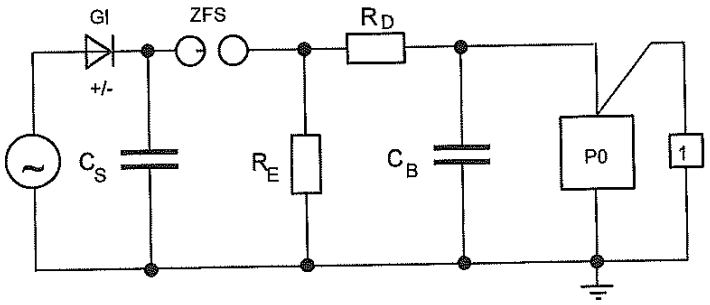
4.4 Test arrangement

The test voltage was applied between the connected terminals of primary winding and earth. The fastening screws, the core and the terminals of the secondary windings were earthed.

4.5 Test and measuring circuits

Technical data of test circuit

Impulse circuit:	Number of stages	n	=	2
	Impulse capacitance	C_S	=	70 nF
	Loading capacitance	C_B	=	1.5 nF
	Damping resistance	R_D	=	122 Ω
	Discharge resistance	R_E	=	1100 Ω



GI	Rectifier	R_D	Damping resistance
C_S	Impulse capacitance	C_B	Loading capacitance
ZFS	Spark gap	PO	Test object
R_E	Discharge resistance	1	Voltage measurement

Figure 1: Test and measuring circuit for the lightning impulse voltage withstand test

Technical data of measuring circuit

Measuring point	Measured quantity	Measuring sensor/device	Technical parameters
1	Test voltage	R divider of SMR 10/770 type (TURD) with digital measuring instrument of DMI 551 type (Haefely) and LC 574 AL digital oscilloscope type (LeCroy)	Ratio 472.4

ВЯРНО С ОРИГИНАЛА

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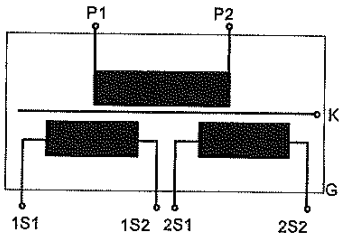
4.6 Test results

Front time of lightning impulse wave:	0.90 µs
Tail time of lightning impulse wave:	56.0 µs
Air temperature:	18.0 °C
Air pressure:	1001 mbar
Air humidity (relative):	50 %
Atmospheric correction of test voltage:	Without

Circuit diagram of the test object			Test voltage	Impulse	Result
					
Test No.:	Voltage applied to	Earthed	kV		No. of impulses/ disruptive discharges
1003 0233 to 1003 0248	P1 and P2	1S1-1S2, 2S1-2S2 K, G	+62.5 +125	50 % FW impulse 100 % FW impulse	1/0 [1] 15/0 [1]
1003 0249 to 1003 0264	P1 and P2	1S1-1S2, 2S1-2S2 K, G	-62.5 -125	50 % FW impulse 100 % FW impulse	1/0 [1] 15/0 [1]

Notes:

1) The Appendices include only the oscillograms of the reference impulse and of each first and last 100 % full wave (FW) impulse.

4.7 Routine tests after the lightning impulse test

The routine tests to Sub-clause 6.2 of the normative document are part of the type test – lightning impulse test – and serve to assess the latter.

Results

Test	Test parameters	Test results	
Power-frequency withstand test on the primary winding	Test voltage: 50 kV Test frequency: 50 Hz Duration of test: 60 s	No disruptive discharge	o.k.
Partial discharge measurement	Procedure A Prestress duration: 60 s Measuring voltage (points 1 to 3): 1.2 x U_m = 28.8 kV U_m = 24.0 kV 1.2 x $U_m/\sqrt{3}$ = 16.6 kV Measuring time: 30 s	 Partial discharge < 2.5 pC < 50 pC Partial discharge < 2 pC < 50 pC Partial discharge < 2 pC < 20 pC	o.k.
Power-frequency withstand test on the secondary windings	Test voltage: 3 kV Test frequency: 50 Hz Duration of test: 60 s	No disruptive discharge	o.k.
Interturn overvoltage test	Procedure A Test current (primary): 1250 A Test voltage (secondary 1): 373 V Test voltage (secondary 2): 1093 V Test frequency: 50 Hz Duration of test: 60 s	No disruptive discharge	o.k.

Notes:

The routine tests did not show anything that could have indicated a damage done to the test object during the previous lightning impulse test.

ВЯРНО С ОРИГИНАЛА

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5. Determination of errors

5.1 Test laboratory

Low-voltage test laboratory, test room 3

5.2 Normative document

IEC 60044-1: 1996-12, mod. + am1: 2000-07, Sub-clauses 11.4 and 12.4

5.3 Required test parameters

Protective current transformer: The current errors shall be determined at 100 % of rated current and 100 % of rated burden.

Measuring current transformer: The current errors shall be determined at 5 %, 20 %, 100 % and 120 % of rated current and 25 % and 100 % of rated burden.

For a burden less than 5 VA a power factor of cos β = 1 shall be used, otherwise a power factor of cos β = 0.8 shall be applied.

The test frequency shall equal the rated frequency and be 50 Hz.

Maximum permissible error limits of current transformers for measuring and protecting purposes:

Accuracy class	Current error at percentage of rated current				Phase displacement at percentage of rated current			
	%				Minutes			
	5	20	100	120	5	20	100	120
0.5	1.5	0.75	0.5	0.5	90	45	30	30
5P	1				60			

5.4 Test arrangement

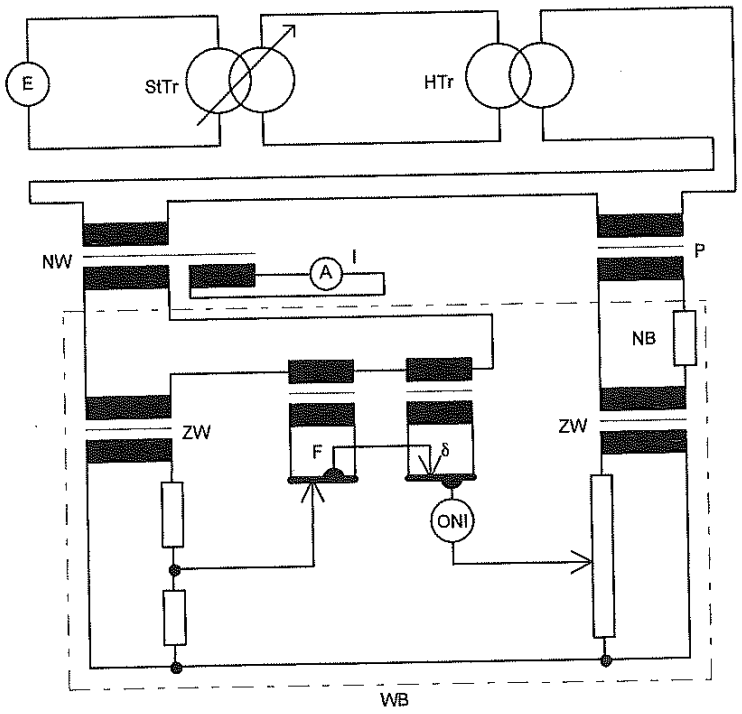
To IEC 60044-1: 1996, mod. + am1: 2000, Sub-clauses 11.4 and 12.4

After it had been demagnetised, the test object was connected via a matching transformer to an instrument transformer measuring device including a measurement standard transformer. An oscillographic null detector was used for the visual check of the comparison. The test object was subjected to the prescribed test conditions by connection of a standard burden.

5.5 Test and measuring circuits

Technical data of test and measuring circuits

Device	Type	Technical data
Standard current transformer NW	ITN 0.5a (TuR Dresden)	Ratio 5 A ... 3 kA / 5 and 5 A, resp. Class 0.1, 15 VA
Standard burden of current transformer NB	(AEG)	50 Hz, 1.25 ... 90 VA ß = 0.8/1, 1 ... 2 A
Instrument transformer measuring bridge I	Hohle type (AEG)	16 $^{2}/_{3}$, 50 and 60 Hz
Matching transformer to the bridge ZW	Hohle type (AEG)	Matching transformer for 1, 2, 5, 10 A
Null detector ONI	OIK (MWB)	20 mm/µV



E Power supply
StTr Adjusting transformer
HTr High-current transformer

Figure 2: Test and measuring circuit for the determination of errors

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5.6 Test results

Rated current: 1250 A
Transformation ratio: 1250 A/5 A Burden: 15 VA, cos β = 0.8

At percentage of rated current	Errors		Permissible error for accuracy class 0.5	
	Current error	Phase displacement	Current error	Phase displacement
	%	Minutes	%	Minutes
120 %	0.11	-0.8	± 0.5	± 30
100 %	0.10	-0.9	± 0.5	± 30
20 %	-0.23	3.0	± 0.75	± 45
5 %	-0.78	9.3	± 1.5	± 90

Rated current: 1250 A
Transformation ratio: 1250 A/5 A Burden: 3.75 VA, cos β = 1

At percentage of rated current	Errors		Permissible errors for accuracy class 0.5	
	Current error	Phase displacement	Current error	Phase displacement
	%	Minutes	%	Minutes
120 %	0.33	4.0	± 0.5	± 30
100 %	0.32	4.2	± 0.5	± 30
20 %	0.18	9.9	± 0.75	± 45
5 %	-0.08	21.3	± 1.5	± 90

Rated current: 1250 A
Transformation ratio: 1250 A/5 A Burden: 15 VA, cos β = 0.8

At percentage of rated current	Errors		Permissible error for accuracy class 5P	
	Current error	Phase displacement	Current error	Phase displacement
	%	Minutes	%	Minutes
100 %	-0.15	0.8	± 1	± 60

The measured current error and phase displacement values are within the limits permissible for accuracy class 0.5 for measuring current transformers and class 5P for protective current transformers.

6. Short-time current tests

6.1 Dynamic test and thermal short-time current test

6.1.1 Test laboratory

High-power test laboratory, high current test bay

6.1.2 Normative document

IEC 60044-1: 1996-12, mod. + am1: 2000-07, Sub-clause 7.1

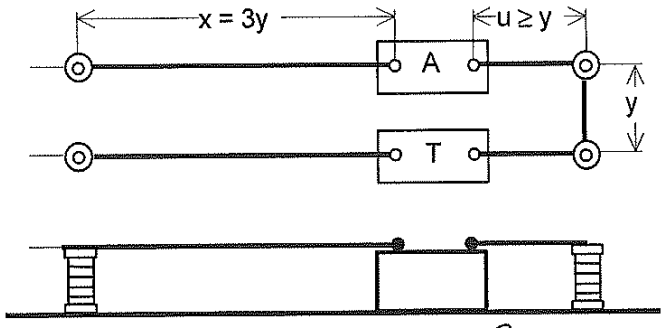
6.1.3 Required test parameters

Short-circuit current	31.5	kA
Peak current	80	kA
Duration of short-circuit	3	s
Joule integral	2977 x 10^6	A^2s

6.1.4 Test arrangement

The test was carried out single-phase in accordance with the STL guide to the interpretation of IEC 60044-1. A second current transformer of the same type was set up in the return conductor.
The pole centres distance was to the manufacturer's instructions.
The distance x was 690 mm, the distances u and y were 230 mm.
The test object was connected by copper bars of 80 mm x 10 mm.
The secondary windings were short-circuited by flexible copper conductors of 10-mm^2 cross-section.

See Figures 9 and 10, Sheet 24.



A Auxiliary current transformer
T Test object
y Minimum pole centre distance declared by the client

Figure 3: Test arrangement for the short-time current tests

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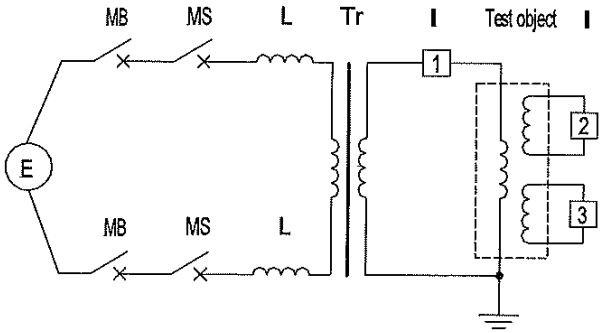
6.1.5 Test and measuring circuits

Technical data of the test circuit

Test requirement		Short-time current tests
Test No.		103 0801 and 103 0802
Number of phases	(Test circuit)	1
Number of poles/phases	(Test object)	1
Power frequency	Hz	50
Power factor cos φ		‹ 0.15
Earthing conditions	Grid	Not earthed
	Short-circuit transformer	Not earthed
	Short-circuit point	Earthed
Short-circuit power of the test circuit		150 MVA
Current measurement		Rogowski measuring device



E	Power supply	Tr	Short-circuit transformer
MB	Master breaker	I	Current measurement
MS	Making switch	1 - 3	Measuring points
L	Current limiting reactor		

Figure 4: Test circuit

Technical data of the measuring circuits

Test No.	Measuring point	Symbol in oscillograms	Measuring quantity	Measuring sensor/device
103 0801 and 103 0802	1	i	Short-circuit current primary winding	Rogowski measuring device
	2	i1 sek	Short-circuit current secondary winding 1	Rogowski measuring device
	3	i2 sek	Short-circuit current secondary winding 2	Rogowski measuring device
Recording instrument: BE256 transient recorder				

6.1.6 Test results

Test object:	Current transformer, Serial No. 03/00811
Condition of test object before test:	Prestressed
Connection of test object:	See Sheet 13
Short-circuit point:	Secondary windings
Ambient temperature:	15 °C

Test values:

Test No. 103 ..		0801	0802
Peak current primary winding	kA	81.7	52.6
Short-circuit current, r.m.s. value primary winding	kA	30.3	32.6
Short-circuit current, r.m.s. value secondary winding 1	A	195	166
Short-circuit current, r.m.s. value secondary winding 2	A	211	-
Short-circuit duration	ms	205	3010
Joule integral 10^6	A^2s	-	3199
Short-circuit current 3 s	kA	-	32.7
Note		1)	2)

Notes:

1) Test with dynamic current
2) Test with short-time thermal current

Condition of test object after test:

The current transformer did not show any visible damage. See Figure 10, Sheet 24.

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6.2 Determination of errors after the short-time current test

Rated current: 1250 A
Transformation ratio: 1250 A/5 A Burden: 15 VA, cos β = 0.8

At percentage of rated current	Difference between the errors measured before and after the short-time current test		Permissible errors for accuracy class 0.5	
	Current error	Phase displacement	Current error	Phase displacement
	%	Minutes	%	Minutes
120 %	0.01	0.4	± 0.25	± 15
100 %	0.01	0.4	± 0.25	± 15
20 %	0.00	0.3	± 0.375	± 22.5
5 %	-0.03	1.4	± 0.75	± 45

Rated current: 1250 A
Transformation ratio: 1250 A/5 A Burden: 3.75 VA, cos β = 1

At percentage of rated current	Difference between the errors measured before and after the short-time current test		Permissible errors for accuracy class 0.5	
	Current error	Phase displacement	Current error	Phase displacement
	%	Minutes	%	Minutes
120 %	0.00	0.4	± 0.25	± 15
100 %	0.00	0.3	± 0.25	± 15
20 %	0.00	0.6	± 0.375	± 22.5
5 %	0.01	-0.1	± 0.75	± 45

The measured differences of current error and phase displacement are within the limits permissible for accuracy class 0.5. The test object is able to comply with the requirements of accuracy class 0.5 after the short-time current test.

Determination of errors after the short-time current test (continued)

Rated current: 1250 A
Transformation ratio: 1250 A/5 A Burden: 15 VA, cos β = 0.8

At percentage of rated current	Difference between the errors measured before and after the short-time current test		Permissible error for accuracy class 5P	
	Current error	Phase displacement	Current error	Phase displacement
	%	Minutes	%	Minutes
100 %	0.0	-0.2	± 0.5	± 30

The measured differences of current error and phase displacement are within the limits permissible for accuracy class 5P. The test object is able to comply with the requirements of accuracy class 5P after the short-time current test.

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6.3 Routine test after the short-time current test

The dielectric routine tests to Sub-clause 6.2 of the normative document are part of the type test – short-time current test – and serve to assess the latter.

Results

Test	Test parameters	Test results	
Power-frequency withstand test on the primary winding	Test voltage: 45 kV Test frequency: 50 Hz Duration of test: 60 s	No disruptive discharge	o.k.
Partial discharge measurement	Procedure A Prestress duration: 60 s Measuring voltage (points 1 to 3): $1.2 \times U_m = 28.8$ kV $U_m = 24.0$ kV $1.2 \times U_m/\sqrt{3} = 16.6$ kV Measuring time: 30 s	 Partial discharge < 2 pC < 50 pC Partial discharge < 2 pC < 50 pC Partial discharge < 2 pC < 20 pC	o.k.
Power-frequency withstand test on the secondary windings	Test voltage: 2.7 kV Test frequency: 50 Hz Duration of test: 60 s	No disruptive discharge	o.k.
Interturn overvoltage test	Procedure A Test current (primary): 1250 A Test voltage (secondary 1): 373 V Test voltage (secondary 2): 1093 V Test frequency: 50 Hz Duration of test: 60 s	No disruptive discharge	o.k.

Notes:

The routine tests did not show anything that could have indicated a damage done to the test object during the previous short-time current test.

7. Temperature-rise test

7.1 Test laboratory

Low-voltage test laboratory, test room 3

7.2 Normative document

IEC 60044-1: 1996-12, mod. + am1: 2000-07, Sub-clause 7.2

7.3 Required test parameters

Test current	1500	A
Test frequency	50	Hz

7.4 Test arrangement

To IEC 60044-1: 1996, mod. + am1: 2000, Sub-clause 7.2

The current transformer was tested in a single-phase outdoor current circuit. Both cores were subjected to their rated burden with a power factor cos β = 1.

7.5 Test and measuring circuits

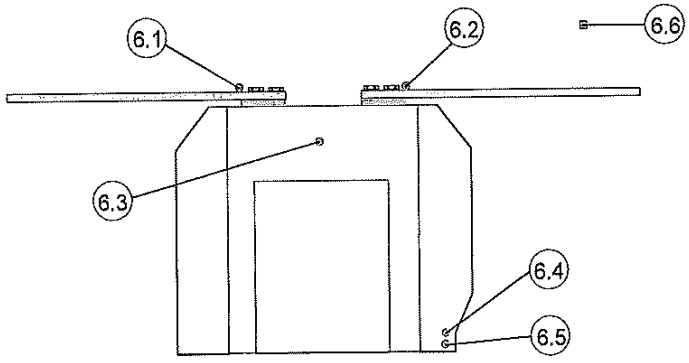

Figure 5: Arrangement of temperature measuring points

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Test and measuring circuits (continued)

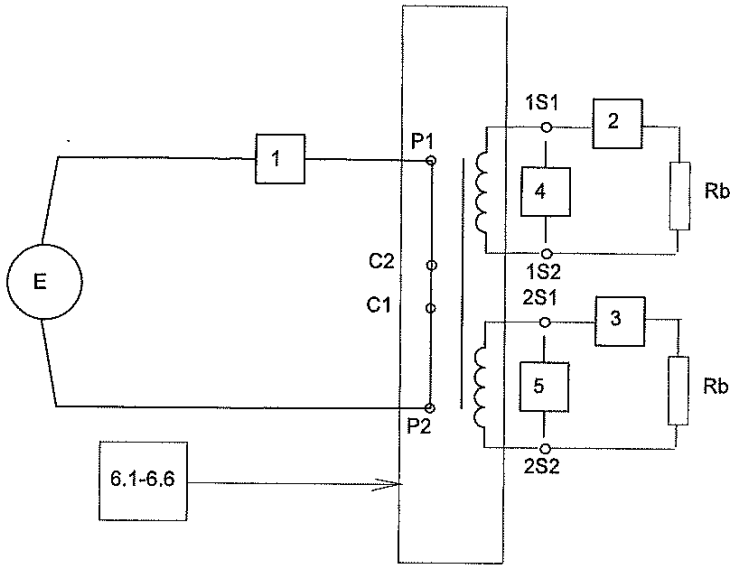

Figure 6: Circuit for the temperature-rise test

Technical data of measuring circuits

Measuring point	Measured quantity	Measuring sensor/device
1	Test current	Current transformer, digital display device
2 and 3	Secondary current	Digital display device
4 and 5	Winding resistance	Milliohmmeter PM 04
6.1 to 6.6	Temperature	Therm 5500-3, CoCo thermocouples

7.6 Test results

The test current was 1500 A (50 Hz). This is equivalent to the rated primary continuous thermal current of the current transformer.

Meas. point	Designation of the part	Material	Permissible temperature-rise limit K	Measured final temperature at ΔT≤1 K/h °C	Final temperature rise (related to average ambient air temperature) K
6.1	Current bar	Cu	80	59.3	42.6
6.2	Current bar	Cu	80	61.1	44.4
6.3	Transformer case	Insulating material	-	45.6	-
6.4	5-A winding 1	Cu wire	75	84.1	67.4
6.5	5-A winding 2	Cu wire	75	83.4	66.7
6.6	Ambient air	Air	-	16.7	-

Determination of the current transformer's winding temperature rise.

The current transformer was tested at rated burden. The temperature rise θ of the current transformer winding was determined on the basis of the rise of winding resistance from the cold state to the steady state of temperature rise of the complete assembly using the following formula given by DIN VDE 0532 Teil 2, Sub-clause 3.3 (transformers and reactors).

$$\theta_w = \frac{R_w}{R_k} (235 + \theta_k) - 235$$

Where:
- R_k Cold resistance of the winding at 18.5 °C
- R_w Warm resistance of the winding at 16.7 °C of ambient air temperature
- θ_k Cold temperature of winding
- θ_w Final temperature of the winding

The hot resistance of the secondary winding was calculated on the basis of the measurement of the cooling curve.

	R_k mΩ	R_w mΩ	R_w/R_k	θ_w °C	θ K	Permissible K
Core 1/5 A	136.3	171.6	1.26	84.1	67.4	75
Core 2/5 A	192.8	242.2	1.26	83.4	66.7	75

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Test results (continued)

Graphic representation of resistance variation (core 1)

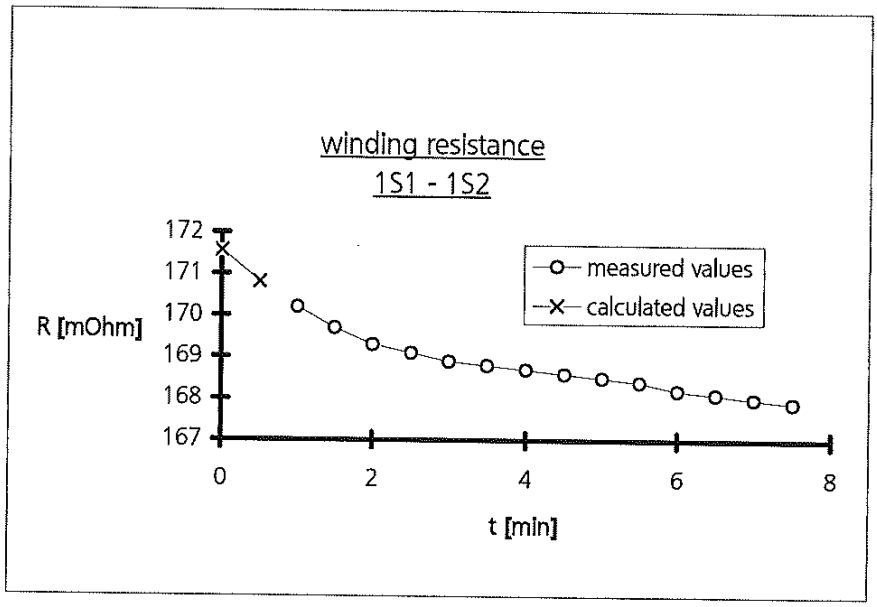

Figure 7: Cooling curve of core 1

Graphic representation of resistance variation (core 2)

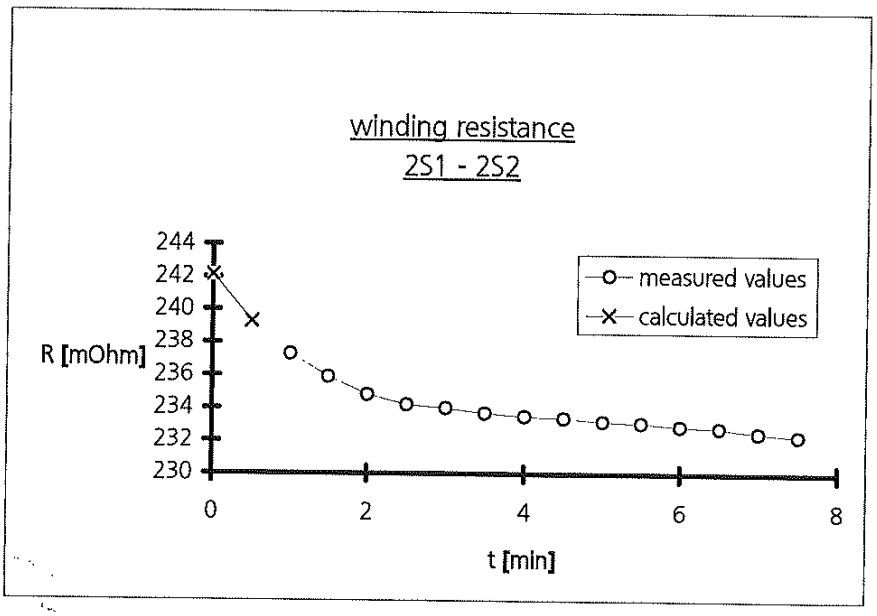

Figure 8: Cooling curve of core 2

8. Evaluation of all tests

- **Lightning impulse test**

During the test at 125-kV lightning impulse voltage, no disruptive discharge occurred. The recorded voltage curve did not present any significant variation between recordings at reference impulse and at full impulse level.
The routine tests have successfully been repeated.

The requirements specified by IEC 60044-1: 1996, Sub-clause 7.3.2 have been met.

The current transformer has PASSED the type test – impulse voltage test.

- **Determination of errors**

The measured current error and phase displacement values are within the limits permissible for accuracy class 0.5 for measuring current transformers and class 5P for protective current transformers.

The requirements specified by IEC 60044-1: 1996, Sub-clauses 11.4 and 12.4 have been met.

The current transformer has PASSED the type test – determination of errors.

- **Short-time current test**

The current transformer is capable of properly carrying its rated dynamic current of 80 kA and its rated short-time thermal current of 31.5 kA for a duration of short-circuit of 3 s.

- After test, the current transformer was not visibly damaged.
- The errors determined after test did not differ from those recorded before test by more than half the limits of error appropriate to its accuracy class.
- During the dielectric tests done after the short-time current test, no disruptive discharge occurred. The partial discharge magnitude was below the permissible limit of 50 pC at 1.2 x U_m.
- The visual inspection of the insulation of the primary winding was not necessary as the current density in the primary winding, related to the rated short-time thermal current, does not exceed 180 A/mm^2.

The requirements specified by IEC 60044-1: 1996-12, Sub-clause 7.1 have been met.

The current transformer has PASSED the type test – short-time current test.

- **Temperature-rise test**

Subjected to its rated primary continuous thermal current of 1500 A, the test object reaches a maximum final temperature rise of 67.4 K in the secondary windings. The final winding temperature-rise limit of 75 K permissible for the class of insulation "E" was not exceeded.

The requirements specified by IEC 60044-1: 1996, Sub-clause 7.2 have been met.

The current transformer has PASSED the type test – temperature-rise test.

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9. Appendices

9.1 Photos

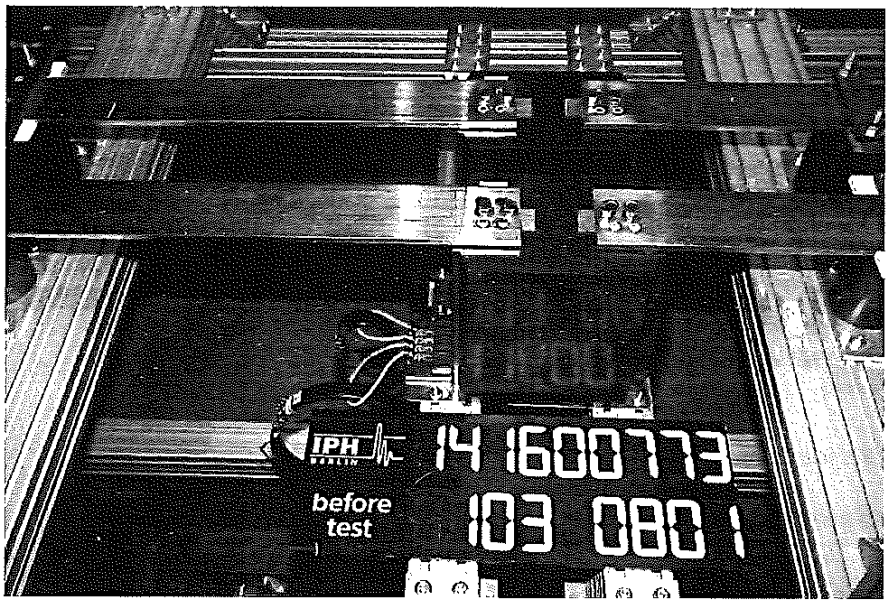


Figure 9: Test arrangement for the short-time current test

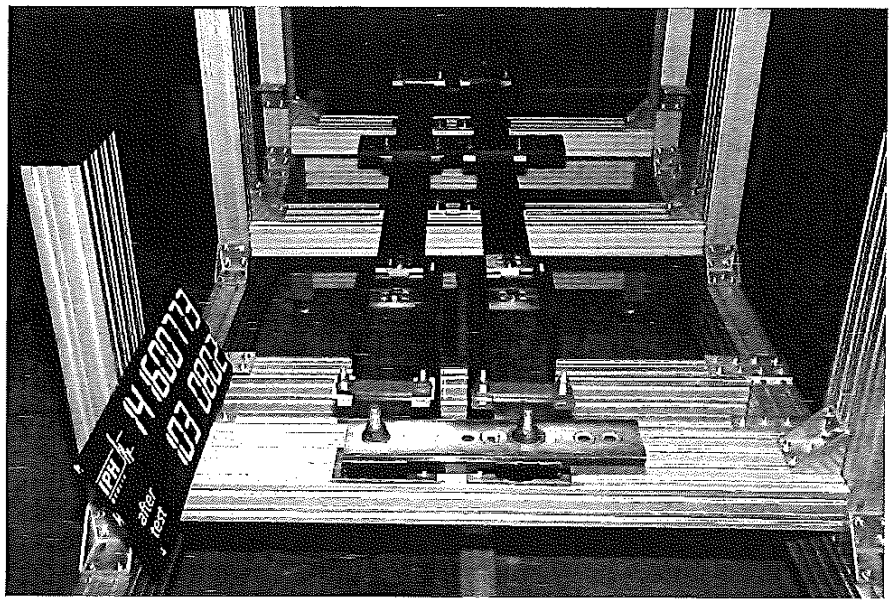
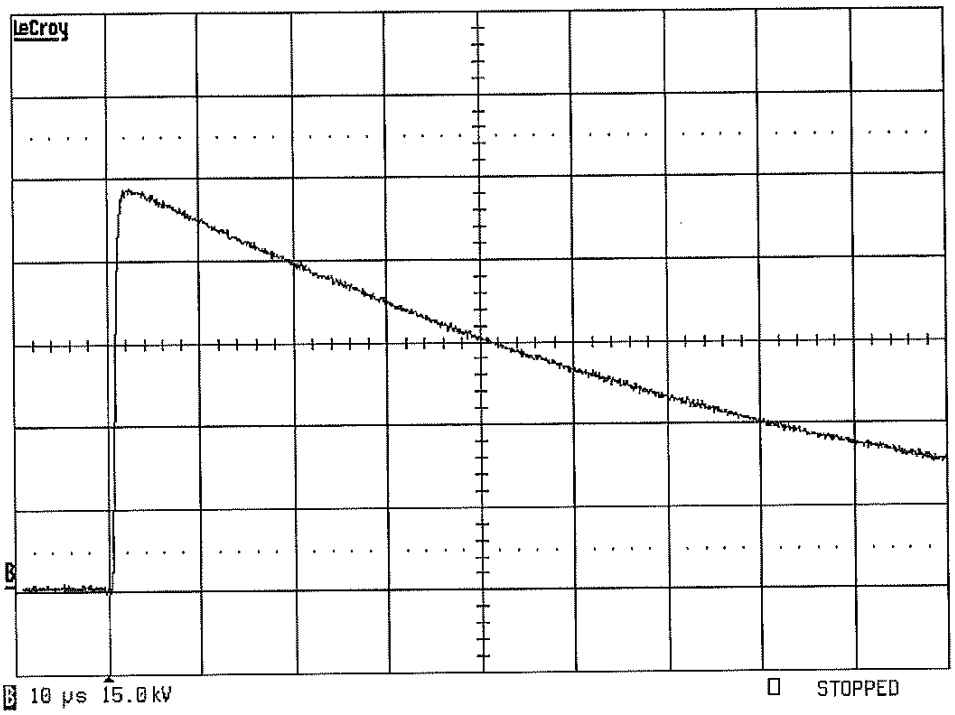


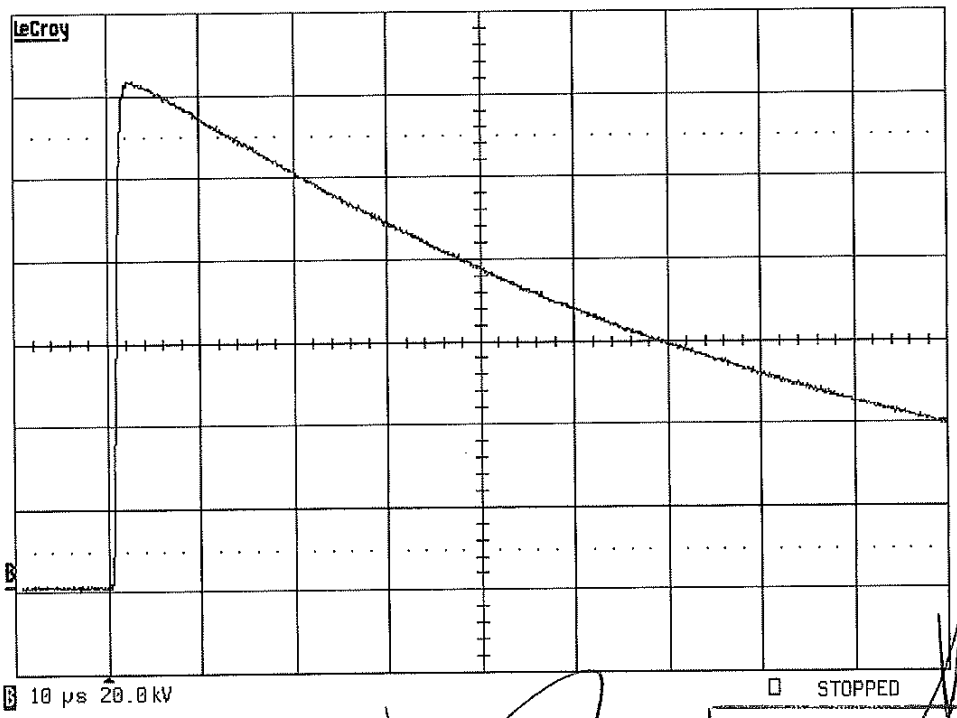
Figure 10: Test object after the short-time withstand current test

9.2 Oscillograms

- **Impulse tests on the primary winding**



Test No. 1003 0233



Test No. 1003 0234

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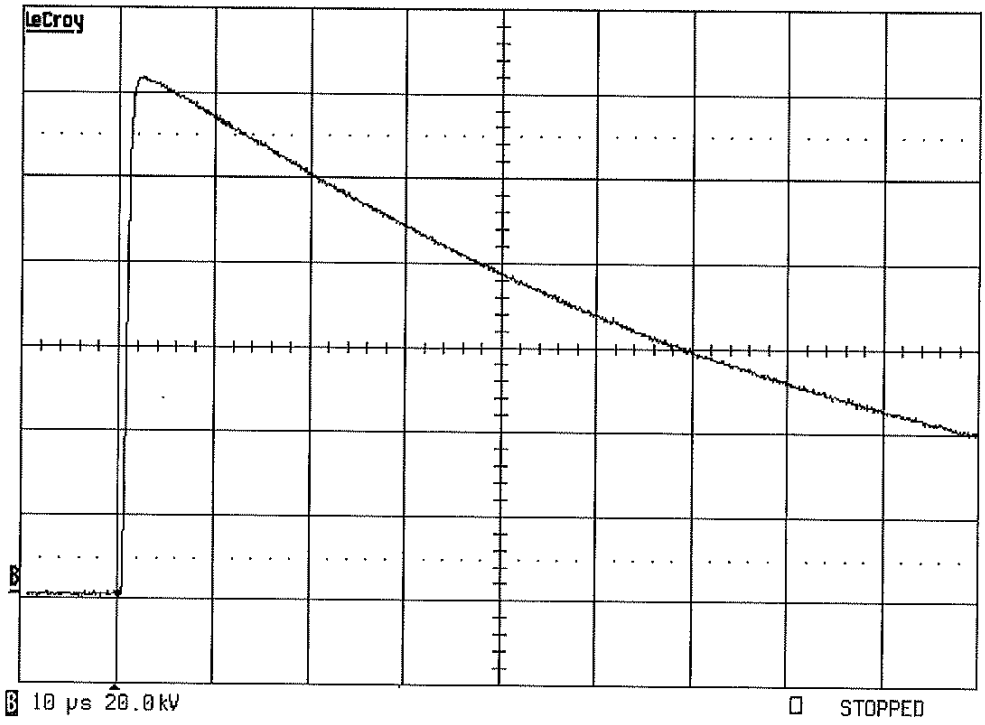
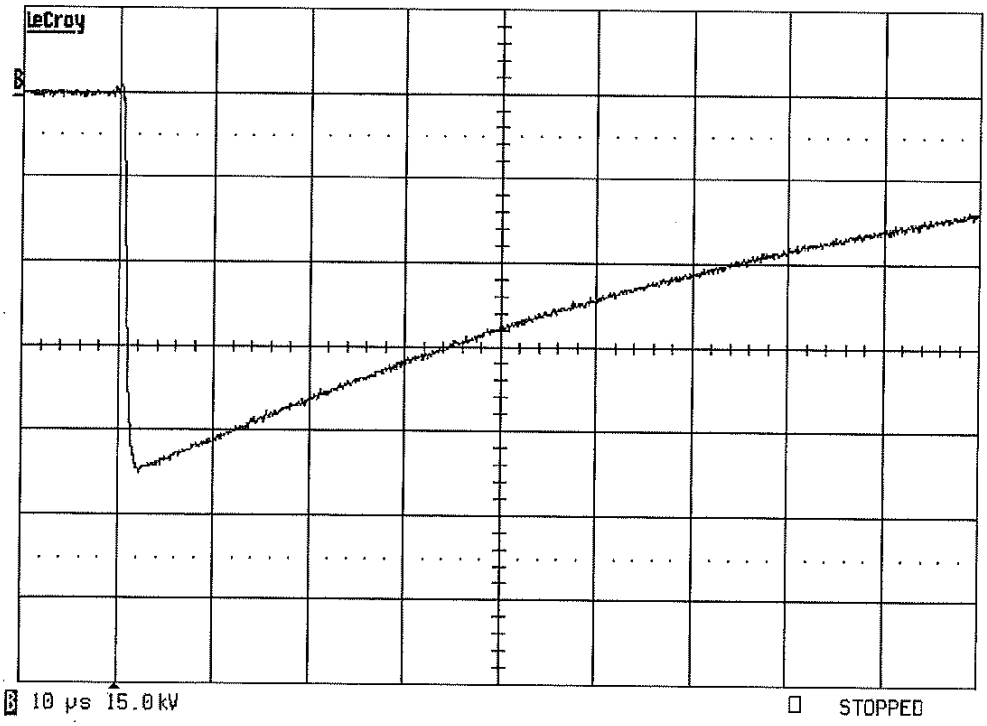
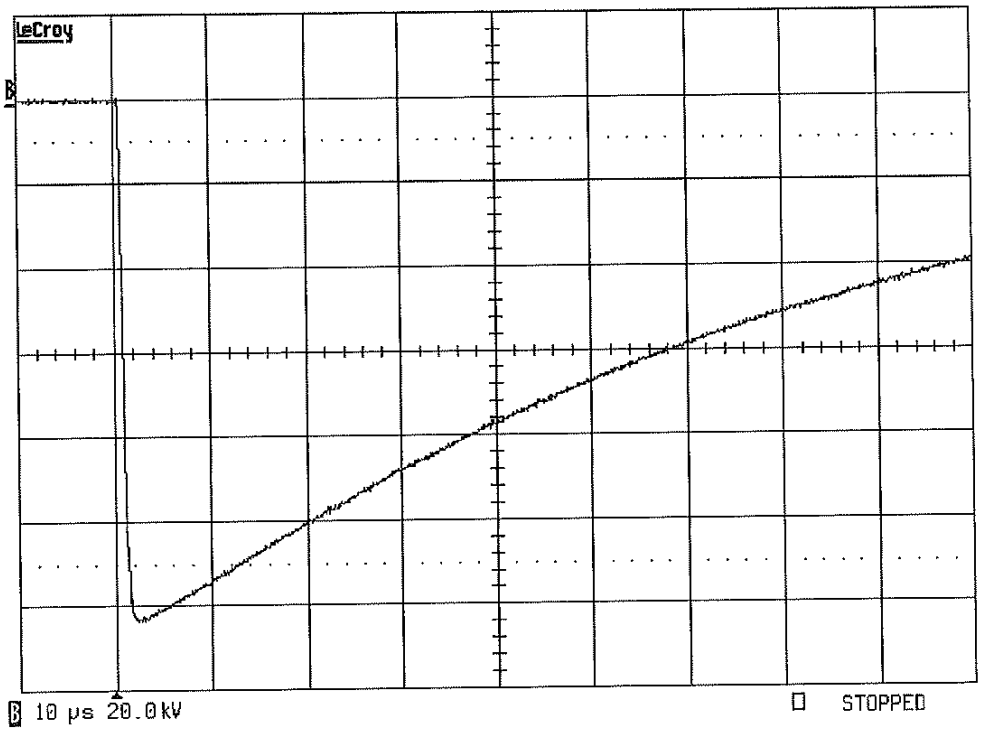


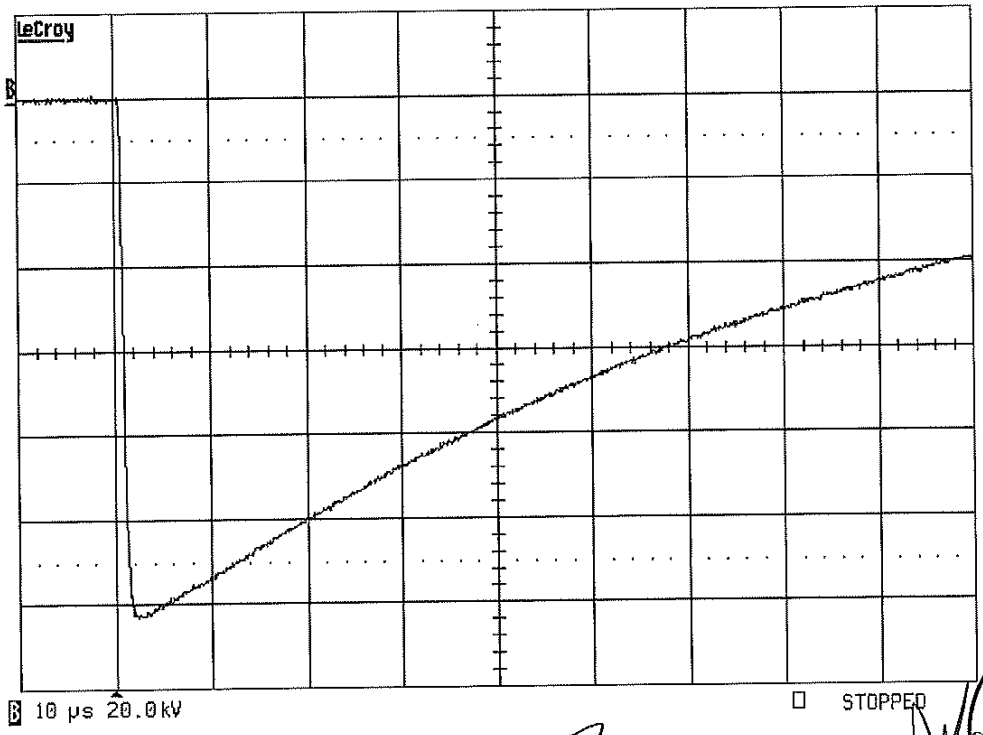
Test No. 1003 0248



Test No. 1003 0249



Test No. 1003 0250



Test No. 1003 0264

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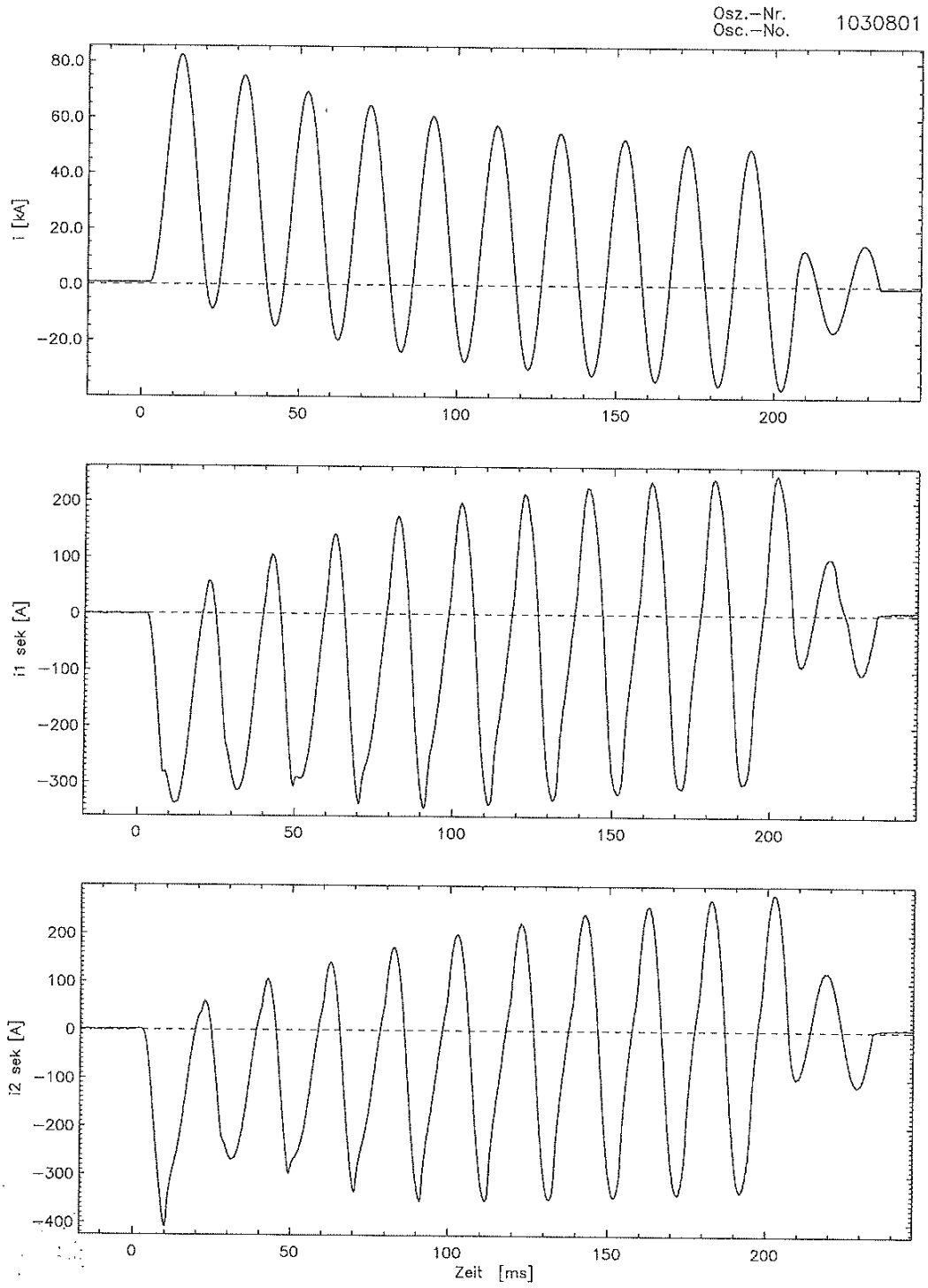
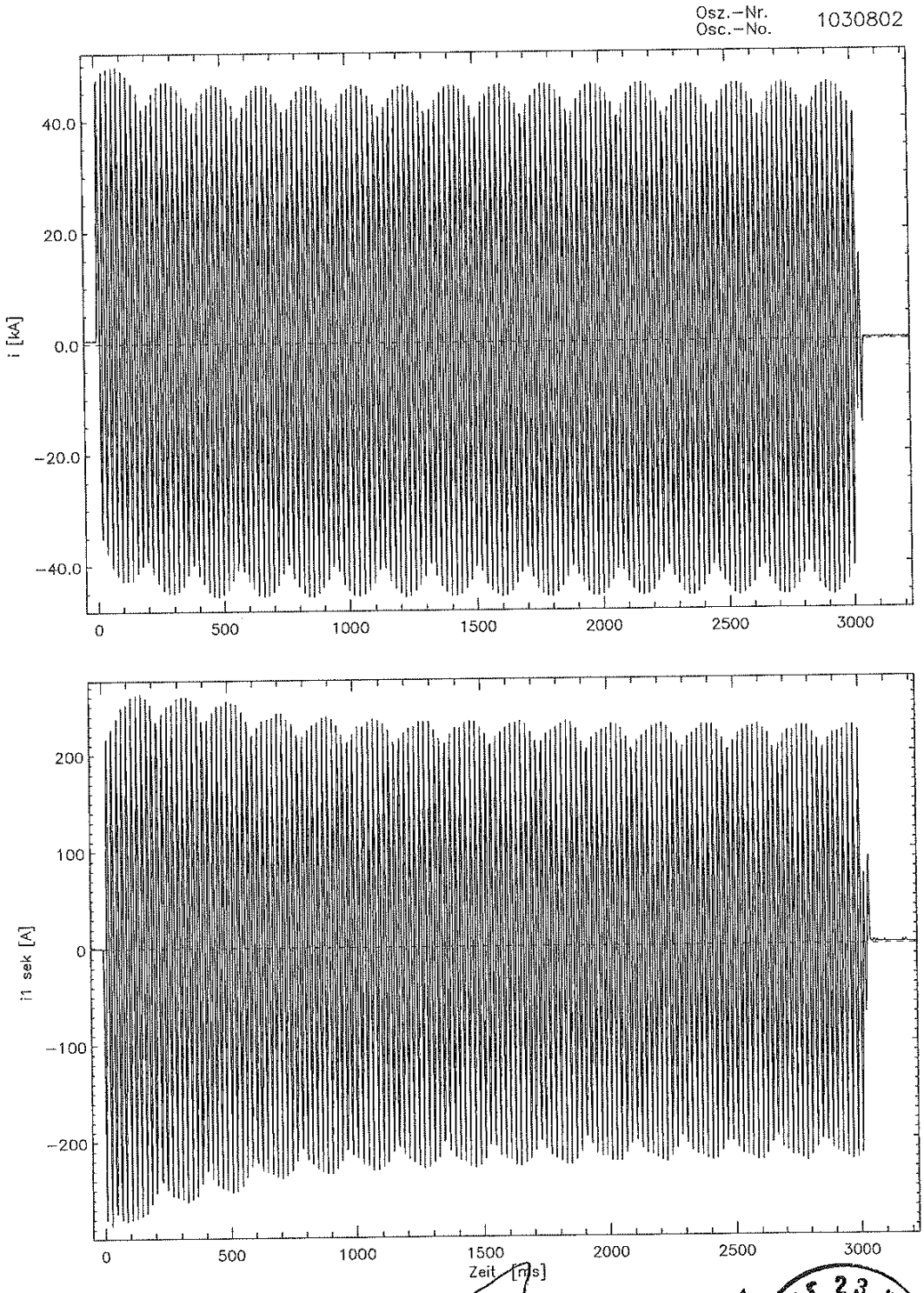
- **Short-circuit test**





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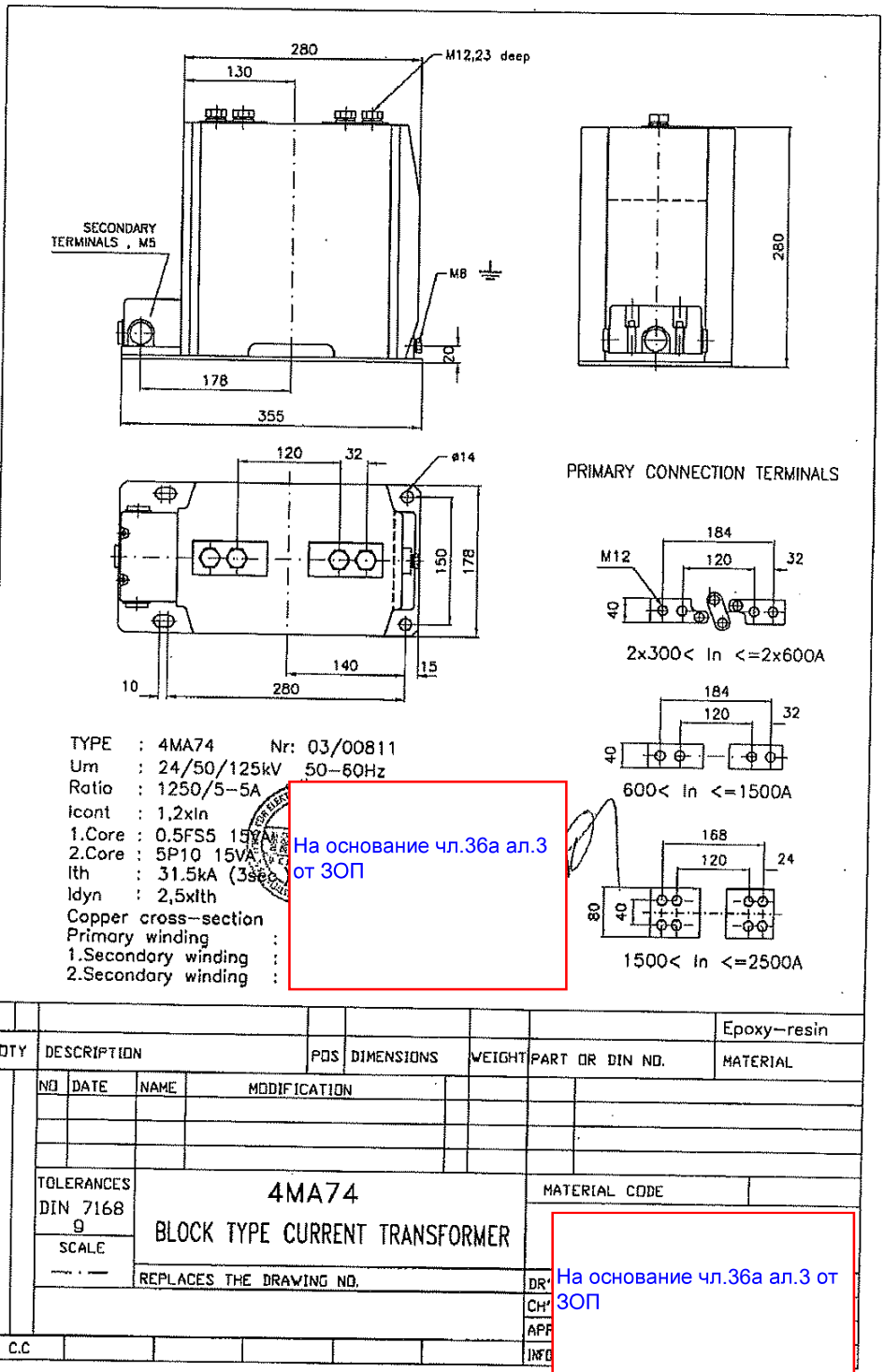
9.3 Drawing


280
130
M12,23 deep
SECONDARY TERMINALS , M5
M8
20
178
355
280
120
32
ø14
150
178
140
15
10
280
PRIMARY CONNECTION TERMINALS
184
M12
120
32
40
2x300< In <=2x600A
184
120
32
40
600< In <=1500A
168
120
24
80
40
1500< In <=2500A
TYPE : 4MA74 Nr: 03/00811
Um : 24/50/125kV 50-60Hz
Ratio : 1250/5-5A
Icont : 1,2xIn
1.Core : 0.5FS5 15VA
2.Core : 5P10 15VA
Ith : 31.5kA (3sec)
Idyn : 2,5xIth
Copper cross-section
Primary winding :
1.Secondary winding :
2.Secondary winding :
На основание чл.36а ал.3 от ЗОП
Epoxy-resin
QTY DESCRIPTION POS DIMENSIONS WEIGHT PART OR DIN NO. MATERIAL
NO DATE NAME MODIFICATION
TOLERANCES DIN 7168 g
SCALE
4MA74
BLOCK TYPE CURRENT TRANSFORMER
REPLACES THE DRAWING NO.
MATERIAL CODE
DR
CH
APP
INFO
C.C
На основание чл.36а ал.3 от ЗОП

ДОКУМЕНТ 2.4

Deutsche Akkreditierungsstelle GmbH
(Германски акредитационен орган ГмбХ)

Упълномощен в съответствие с Подраздел 1 на Раздел 8 на AkkStelleG във връзка с Подраздел 1 на Раздел 1 на AkkStelleG
Подписал Многостранните споразумения на EA, ILAF и IAF за взаимно признаване

Акредитация

Deutsche Akkreditierungsstelle GmbH (Германски акредитационен орган ГмбХ) удостоверява, че изпитвателната лаборатория

IPH Institut "Prüffeld für elektrische Hochleistungstechnik" GmbH
Landsberger Alee 378 A, 12681 Berlin
(Институт ИПХ „Прюфелд фюр Електрише Хохлайщунгстехник" ГмбХ
Алея Ландсбергер 378 A, 12681 Берлин)

е компетентна по условията на DIN EN ISO/IEC 17025:2005 да извършва изпитания в следните области:

Апаратура и компоненти за високо напрежение
Апаратура и компоненти за ниско напрежение
Комутационна, защитна и управляваща апаратура
Кабели и кабелни аксесоари за високо, средно и ниско напрежение

Акредитационният сертификат важи във връзка с известието за акредитация от 11.11.2015 г. с акредитационен номер D-PL-12107-01 и е валиден до 10.11.2020 г. Той се състои от заглавния лист, обратната страна на заглавния лист и следващия анекс с общо 42 страници.

Регистрационен номер на сертификата: **D-PL-12107-01-00**

Франкфурт на Майн, 11.11.2015 г.

/подпис – не се чете/
инж. Ралф Егнер
Ръководител отделение

Този документ е превод. Определящата версия е оригиналният германски акредитационен сертификат.

Вж. забележките на обратната страна на листа.

ВЯРНО С ОРИГИНАЛА

МИГ 23 ЕООД · СОФИЯ · MIG 23 LTD

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Deutsche Akkreditierungsstelle GmbH
(Германски акредитационен орган ГмбХ)

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Офис Франкфурт на Майн
Европа алее 52
60327 Франкфурт на Майн

Офис Брауншвайг
Бундесалее 100
38116 Брауншвайг

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Не трябва да се създава впечатление, че акредикацията е разширена до области извън обхвата на акредитация , удостоверен от DAkkS.

Акредитацията е дадена съгласно Закона за акредитационния орган (AkkStelleG) от 31 юли 2009 г. (Вестник за федерални закони I стр. 2625) и РЕГЛАМЕНТ (ЕО) № 765/2008 на Европейския парламент и на Съвета от 9 юли 2008 г. за определяне на изискванията за акредитация и надзор на пазара във връзка с предлагането на пазара на продукти (Официален вестник на Европейския съюз L 218 от 9 юли 2008 г., стр. 30). DAkkS е подписал Многостранното споразумение за взаимно признаване на европейското сътрудничество за акредитация (EA), Международния акредитационен форум (IAF) и Международното сътрудничество за акредитиране на лаборатории (ILAC). Подписалите тези споразумения признават взаимно своите акредитации.

Текущото състояние на членството може да бъде намерено на следните уебсайтове:
EA: www.european-accreditation.org
ILAC: www. ilac.org
IAF: www.iaf.nu

ВЯРНО С ОРИГИНАЛА

МИГ 23 ЕООД СОФИЯ MIG 23 LTD

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DAkkS
Deutsche
Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH

Entrusted according to Section 8 subsection1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV
Signatory to the Multilateral Agreements of
EA, ILAC and IAF for Mutual Recognition

Accreditation

The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory

IPH Institut "Prüffeld für elektrische Hochleistungstechnik" GmbH
Landsberger Allee 378 A, 12681 Berlin

is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields:

High-voltage equipment and components
Low-voltage equipment and components
Installation, switching, control and protective equipment
High-voltage, medium-voltage and low-voltage cables and their accessories

The accreditation certificate shall only apply in connection with the notice of accreditation of 2015-11-11 with the accreditation number D-PL-12107-01 and is valid until 2020-11-10. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 42 pages.

Registration number of the certificate: **D-PL-12107-01-00**

На основание чл.36а ал.3 от ЗОП

ВЕРНО С ОРИГИНАЛА

MIG 23 LTD. СОФИЯ

Frankfurt, 2015-11-11

This document is a translation. The definitive version is the original German accreditation certificate.

See notes overleaf.

000159

Deutsche Akkreditierungsstelle GmbH

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Office Frankfurt am Main
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ДОКУМЕНТ 2.5

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ДЕКЛАРАЦИЯ

че предложеното оборудване в процедурата отговаря на минималните технически изисквания на Възложителя, посочени в таблица 2

Долуподписаният Антон Иванов Илиев, в качеството ми на представляващ „МИГ 23" ЕООД, участник в процедура за изпълнение на обществена поръчка с реф. **№ PPD 19-103** и предмет: **„ Модернизация (ретрофит /проектиране, реконструкция, доставка и монтаж на машини и съоръжения, подготовка и въвеждане в експлоатация/) на възлови разпределителни станции 20 (10) kV и изграждане на вериги на телемеханика в регион „Ловеч - Враца", регион „Монтана – Видин" и регион „Плевен"**

ДЕКЛАРИРАМ, ЧЕ:

Предложеното от нас оборудване в процедурата, отговаря на минималните технически изисквания на Възложителя за СТАНДАРТ НА МАТЕРИАЛА ЗА ТОКОВИ ТРАНСФОРМАТОРИ 20 KV ЗА МОНТИРАНЕ НА ЗАКРИТО, ФИКСИРАН, посочени в таблица 2, както следва:

Параметри на електрическата разпределителна мрежа:

№	Параметър	Стойност
1.	Обявено напрежение	20 000 V
2.	Максимално работно напрежение	24 000 V
3.	Обявена честота	50 Hz
4.	Начин на заземяване на звездния център	изолиран звезден център
5.	Ток на късо съединение	15 кА

Характеристики на работната среда и място на монтиране:

№	Характеристика /място на монтиране	Стойност/описание
1.	Максимална околна температура	+ 40°C
2.	Минимална околна температура	Минус 5°C
3.	Относителна влажност	До 95 %
4.	Замърсяване с прах, пушек, агресивни газове и пари	Умерено
5.	Надморска височина	До 1 000 m
6.	Място на монтиране	В ЗРУ, КРУ, ТП

Технически параметри на токови измервателни трансформатори 20 kV, 1250/5/5 А, подпорен тип, за монтиране на закрито, които се гарантират от Участника чрез Декларация *(съгласно образеца в документацията)*, че предложеното оборудване отговаря на посочените по-долу минималните технически изисквания на Възложителя:

№	Параметър	Минимални технически изисквания
1.	Обявен първичен ток, I_{pr}	1250 А
2.	Обявен първичен ток на термична устойчивост, I_{th}	≥ 31,5 кА/1 s
3.	Обявен първичен ток на динамична устойчивост, I_{dyn}	≥ 79 кА
4.	Обявени вторични токове:	-
-	за измервателната намотка	5 А
-	за намотката за защитата	5 А
5.	Обявени коефициенти на трансформация:	-
-	за измервателната намотка	1250/5 А
-	за намотката за защита	1250/5 А

Технически параметри на токови измервателни трансформатори 20 kV, 400/5/5 А, подпорен тип, за монтиране на закрито, които се гарантират от Участника чрез Декларация *(съгласно образеца в документацията)*, че предложеното оборудване отговаря на посочените по-долу минималните технически изисквания на Възложителя:

000160

№	Параметър	Минимални технически изисквания
1.	Обявен първичен ток, I_{pr}	400 A
2.	Обявен първичен ток на термична устойчивост, I_{th}	≥ 31,5 кА/1 s
3.	Обявен първичен ток на динамична устойчивост, I_{dyn}	≥ 79 кА
4.	Обявени вторични токове:	-
-	за измервателната намотка	5 A
-	за намотката за защитата	5 A
5.	Обявени коефициенти на трансформация:	-
-	за измервателната намотка	400/5 A
-	за намотката за защита	400/5 A

Конструктивни характеристики и др. данни за токови измервателни трансформатори 20 kV, 1250/5/5 A и 400/5/5 A, подпорен тип, за монтиране на закрито, които се гарантират от Участника чрез Декларация *(съгласно образеца в документацията)*, че предложеното оборудване отговаря на посочените по-долу минималните технически изисквания на Възложителя:

№	Характеристика	Минимални технически изисквания
1.	Конструкция	а) Токовите измервателни трансформатори трябва да бъдат от подпорен тип и да бъдат защитени със синтетична, монолитна, твърда изолация, съответстваща на изискванията на БДС EN 60085 или еквивалент. за топлинен клас на изолацията - min 120 (E)
		б) Токовите измервателни трансформатори трябва да бъдат съоръжени с клеми с по две винтови съединения, за свързване на първичната намотка и клемен блок за свързване на вторичните вериги.
2.	Вторични намотки – брой и предназначение	а) Една вторична намотка за целите на измерването.
		б) Една вторична намотка за целите на защитата.
3.	Клеми за свързване на първичната намотка	Клемите трябва да бъдат изработени от мед или медна сплав недопускаща електрохимична корозия при свързването на трансформаторите с медни или алуминиеви шини.
4.	Клемен блок за свързване на вторичните вериги	а) Клемният блок трябва да бъде от винтов тип с възможност за свързване на многожични проводници на вторичните вериги със сечение до 4 mm^2.
		б) Клемният блок трябва да бъде защитен с прозрачен капак за визуален контрол с възможност за пломбиране.
		в) Клемите на клемният блок трябва да бъдат изработени от месинг или друга подходяща некорозираща медна сплав.
		г) Клемният блок трябва да осигурява възможност за заземяваме на изводите на вторичните намотки.
5.	Заземяване	Токовите измервателни трансформатори трябва да бъдат съоръжени със заземителен болт min M8, означен със знак „Защитна земя".
6.	Резбови и скрепителни съединения	Всички резбови и скрепителни съединения трябва да бъдат изработени от месинг или други подходящи некорозиращи метали или метални сплави.
7.	Маркиране на обявените стойности	а) Токовите измервателни трансформатори трябва да бъдат маркирани от страната на клемния блок с информация за обявените стойности върху корпуса на трансформатора или върху табелка съгласно изискванията на т. 6.13 от БДС EN 61869-2 или еквивалент.
		б) Обявените стойности може да бъдат нанесени чрез гравиране върху корпуса на трансформатора или върху табелка изработена от анодизиран алуминий или от еквивалентен устойчив на корозия материал, като за целта не могат да бъдат използвани табелки (етикети) от самозалепващ се тип.
		в) Маркировката трябва да бъде нанесена трайно и четливо по начин, по който да не може да бъде заличена.
		г) Ако се използва табелка, тя трябва да бъде фиксирана здраво към корпуса на токовите измервателни трансформатори чрез устойчиви на корозия нитове.

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№	Характеристика	Минимални технически изисквания
		д) От страната на клемния блок, върху изолацията на токовите измервателни трансформатори допълнително трябва да бъде маркиран с вдлъбнат или релефен печат обявения коефициент на трансформация, с размер на шрифта min 20 mm.
8.	Маркиране на изводите	Изводите на токовите измервателни трансформатори трябва да бъдат маркирани трайно и четливо съгласно изискванията на т. 6.13 от БДС EN 61869-2 или еквивалент.
9.	Първоначална проверка и знаци за удостоверяване (съгласно разпоредбите на Закона за измерванията)	а) Токовите измервателни трансформатори трябва да бъдат доставени след извършване на първоначална метрологична проверка.
		б) Първоначална метрологична проверка трябва да бъде удостоверена със знак за първоначална проверка и копието на протокола от проведените изпитвания.
10.	Експлоатационна дълготрайност	≥ 25 години

Общи технически параметри, характеристики и др. данни токови измервателни трансформатори 20 kV, 1250/5/5 А и 400/5/5 А, подпорен тип, за монтиране на закрито, които се гарантират от Участника чрез Декларация *(съгласно образеца в документацията)*, че предложеното оборудване отговаря на посочените по-долу минималните технически изисквания на Възложителя:

№	Параметър	Минимални технически изисквания
1.	Класове на точност:	-
-	за измервателната намотка	≤ 0,5 S
-	за намотката за защитата	≤ 10P20
2.	Обявен продължителен термичен ток, I_{cth}	≥ 1,2 x I_{pr}
3.	Номинален коефициент на безопасност – FS	≥ 5
4.	Номинална гранична кратност – ALF	≤ 10
5.	Обявени вторични товари:	-
-	за измервателната намотка	≥ 15 VA
-	за намотката за защитата	≥ 30 VA
6.	Обявено издържано напрежение с промишлена честота за изолацията на първичната намотка	≥ 50 kV (ефективна стойност)
7.	Обявено издържано напрежение с мълниев импулс за изолацията на първичната намотка	≥ 125 kV (върхова стойност)
8.	Обявено издържано напрежение с промишлена честота на изолацията за вторичните намотки	≥ 3 kV (ефективна стойност)
9.	Най-високо напрежение за съоръженията, U_m	24 kV (ефективна стойност)
10.	Топлинен клас на изолацията (съгл. БДС EN 60085:2008 или еквивалентен)	≥ 120 (E)
11.	Допустими нива на частичния разряд:	-
-	при 1,2 U_m	≤ 50 pC
-	при 1,2 $U_m/\sqrt{3}$	≤ 20 pC

Дата 31.10.2019 г.

Декларатор: На основание чл.36а ал.3 от ЗОП

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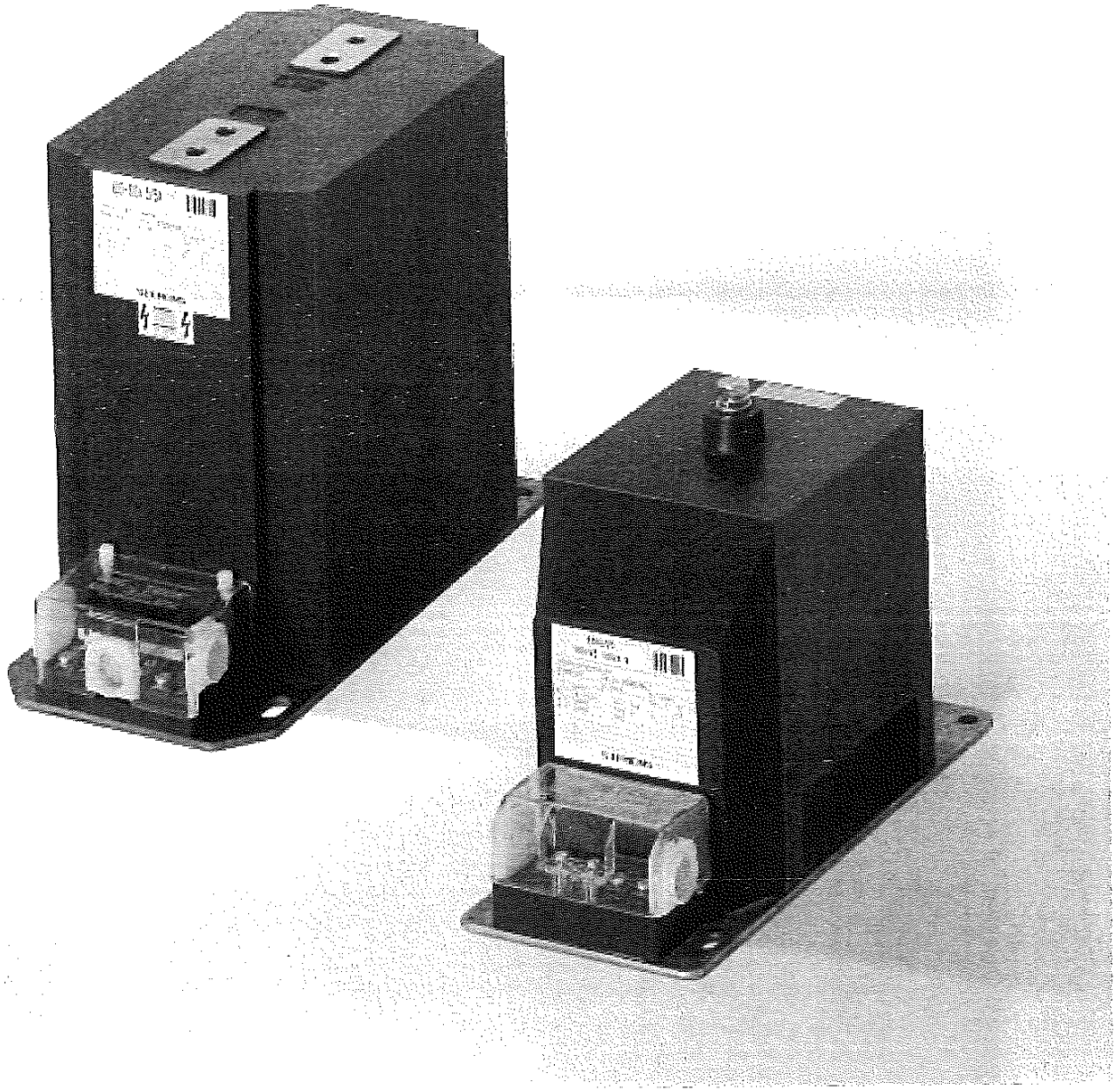
ДОКУМЕНТ 3.1



4M Protective and Measuring Transformers

Medium-Voltage Equipment
Selection and Ordering Data

Catalog HG 24 · 2009

Answers for energy.

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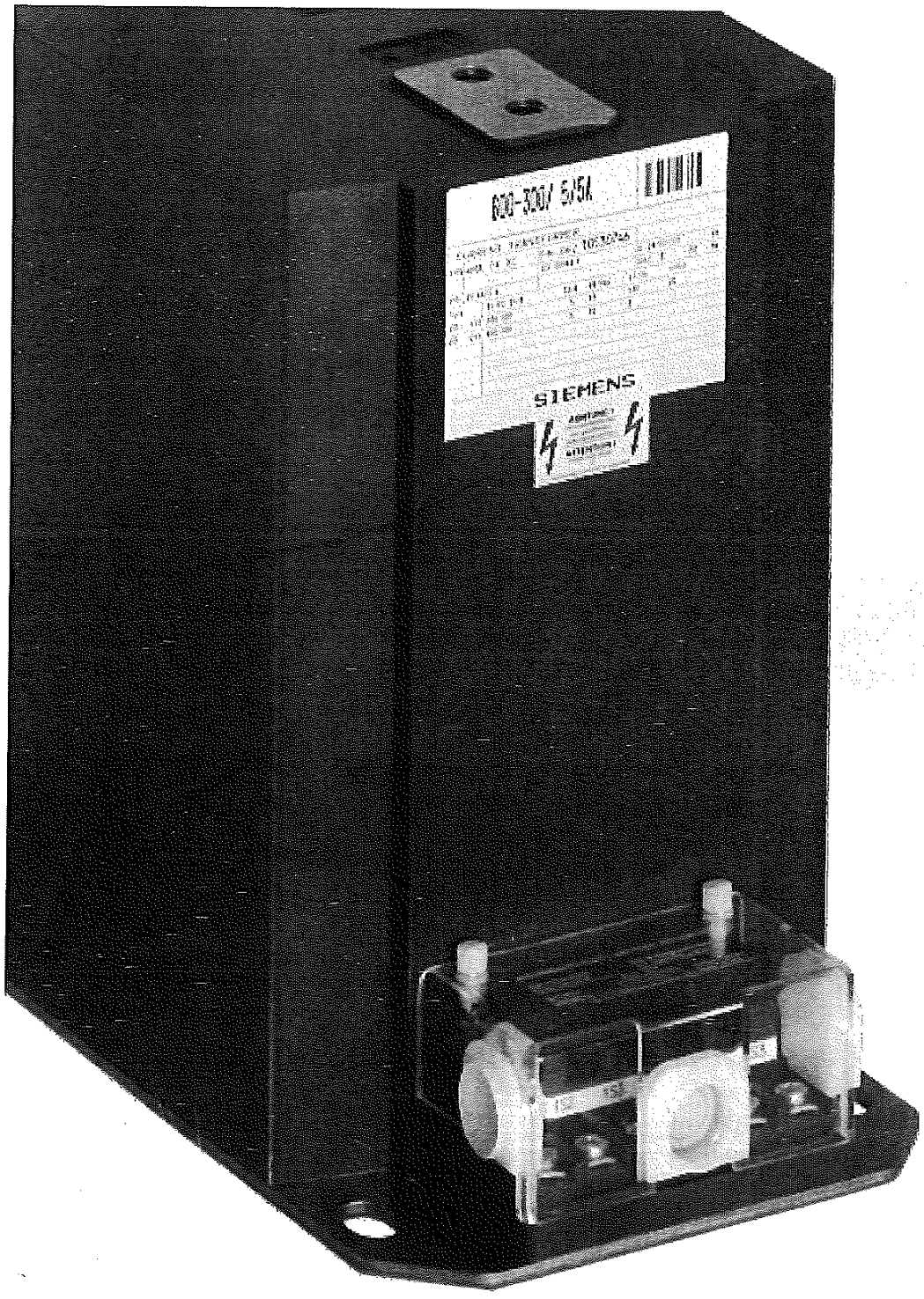

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4M Protective and Measuring Transformers

Medium-Voltage Equipment
Catalog HG 24 · 2009

Invalid: Catalog HG 24 · 1994

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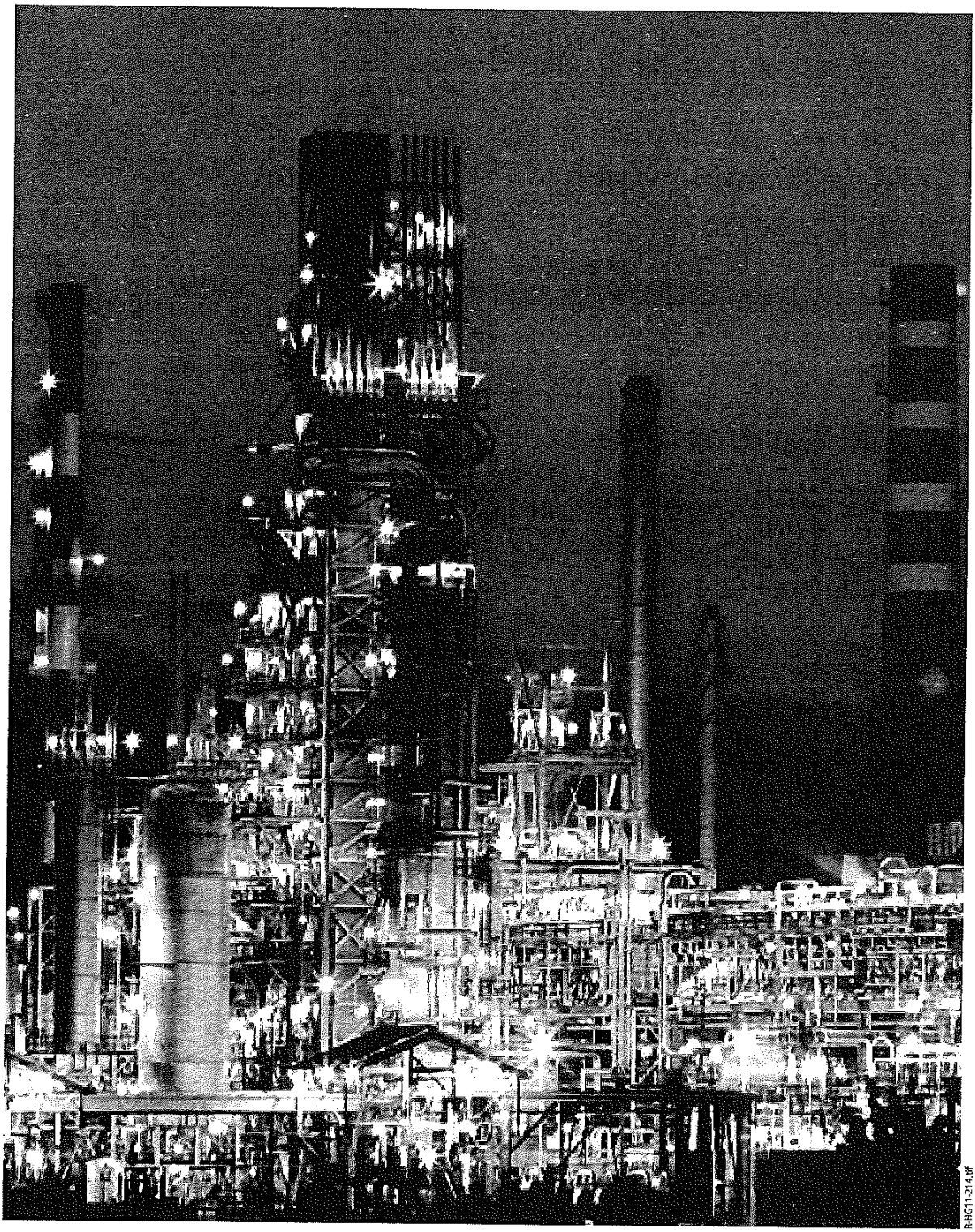

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Industrial application: Refinery

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ВЯРНО С ОРИГИНАЛА
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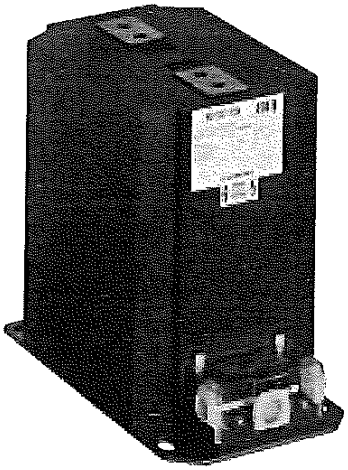
Protective and Measuring Transformers – The Adaptable

1

The task of instrument transformers is to transform high currents and voltages proportionally and in-phase into small current or voltage values for measuring or protection purposes. So they are used either to measure and record the transmitted power or to feed protection devices with evaluable signals, which enable the protection device to e.g. trip a switching device depending on the situation. Furthermore, they isolate the connected measuring or protection equipment electrically from live parts of the switchgear.

Current transformer



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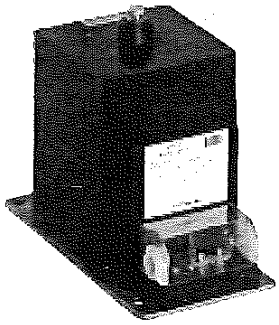
Current transformers can be regarded as transformers working in short-circuit, with the full normal current flowing through their primary side. Devices connected on the secondary side are series-connected. Current transformers can have several secondary windings with magnetically separated cores of the same or different characteristics. They can, for example, be equipped with two measuring cores of different accuracy class, or with measuring and protection cores with different accuracy limit factors.

Due to the risk of overvoltages, current transformers must not be operated with open secondary terminals, but only in short circuit or with the burden of the measuring equipment.

Voltage transformer



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Voltage transformers contain only one magnet core and are normally designed with one single secondary winding. If necessary, earthed (single-phase) voltage transformers are provided with an additional residual voltage winding (earth-fault winding) beside the secondary winding (measuring winding).

In contrast to current transformers, voltage transformers must never be short-circuited on the secondary side. The earth-side terminal of the primary winding is effectively earthed in the terminal box, and must not be removed in operation.

1

Types of construction

Protective and measuring transformers are designed in different types of construction for the multiple installation requirements and operating conditions they are subjected to. They are electrical devices which convert primary electrical values – currents or voltages – into proportional and in-phase values that are adequate for the connected devices such as measuring instruments, meters, protection relays and similar. A distinction is made here between current and voltage transformers.

The following transformer types are available for selection in this catalog:

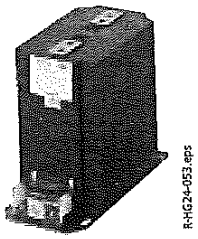
Current transformers

- Indoor support-type current transformer in block-type design
- Indoor support-type current transformer in single-turn design (e.g. bar-primary transformer)
- Indoor bushing-type current transformer in single-turn design
- Indoor bar-primary bushing-type current transformer
- Outdoor support-type current transformer

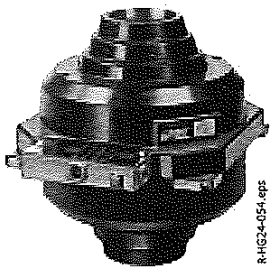
Voltage transformers

- Earthed (single-phase) or unearthed (double-phase) indoor transformers in different sizes
- Earthed (single-phase) or unearthed (double-phase) outdoor transformers in different sizes

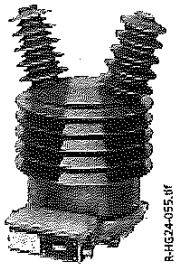
The transformers offered in the selection are only a part of the possible variations. If the transformer required is not shown, please clarify the feasibility with the responsible sales partner or the order processing department in the Switchgear Factory Berlin. The same applies to transformers according to the ANSI standard.



Example for transformer in block-type design



Example for bushing-type transformer



Example for outdoor transformer

Approvals/Certifications

In Germany, instrument transformers may only be used for commercial purposes, such as billing metering of electricity, if they have been approved once (type approval) by the Physikalisch-Technische Bundesanstalt (PTB) (Federal Physical-Technical Institute), and if every transformer is calibrated by an officially recognised inspecting authority.

Calibration is done by a calibration office, or by the transformer manufacturer on behalf of a calibration office. The test is documented by means of a test mark as well as a calibration certificate.

The calibration costs are charged in accordance with the official scale of fees.

ВЯРНО С ОРИГИНАЛА

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Current transformers

Current transformers can be regarded as transformers operating in short circuit, which carry the full rated current on the primary side. The devices on the secondary side are series-connected. They can have several secondary windings with mechanically separated cores of the same or different characteristics. Thus, current transformers can be designed e.g. with two measuring cores of different accuracy class, or with measuring or protection cores with different accuracy limit factors.

Due to the risk of overvoltages, current transformers must not be operated with open secondary terminals, but only in short circuit or with the burden of the measuring equipment.

Glossary of terms

Rated current I_N (r.m.s. value in A)

The rated primary (I_{PN}) and secondary (I_{SN}) current is the current that characterises the transformer, or the current it is designed for. Both values are given on the transformer rating plate. The rated primary current (I_{PN}) depends on the power system and is defined by the system operator.

Usual values for primary currents (in A):

10; 12.5; 15; 20; 25; 30; 40; 50; 60; 75

and their decimal multiples (preferred values are underlined).

Usual values for secondary currents: 1 and 5 A.

For technical reasons, but above all for economical reasons, 1 A is recommended as secondary current, especially if there are long measuring leads.

Rated continuous thermal current I_D (thermal strength)

The value of the current which can be permitted to flow continuously in the primary winding, the secondary winding being connected to the rated burden, without the temperature rise exceeding the values specified.

I_D is often equal to I_N, but it can also be defined as a multiple thereof.

Rated short-time thermal current I_{th}

The r.m.s. value of the primary current, flowing in case of short circuit, which a current transformer will withstand for 1 or 3 seconds without suffering harmful effects, the secondary winding being short-circuited.

Rated dynamic current I_{dyn}

The peak value of the primary current which a transformer will withstand, without being damaged electrically or mechanically by the resulting electromagnetic forces, the secondary winding being short-circuited.

Rated transformation ratio K_N

The ratio of the rated primary current to the rated secondary current. It is expressed as an unreduced fraction, e.g. 500 A/1 A.

Rated output S_N

The value of the apparent power (in VA at a specified power factor), for which the current transformer has to keep the accuracy class at the rated secondary current and with rated burden. Thus, the rated output describes the capacity of a current transformer to "drive" the secondary current within the error limits by means of a burden.

Current transformers can feature the following preferred rated outputs: 2.5 VA; 5 VA; 10 VA; 15 VA; 30 VA.

Rated burden Z_N

The burden is the apparent resistance of the devices connected on the secondary side (including all connection leads), for which the current transformer has to keep the stipulated class limits. The burden is normally expressed as apparent power in VA.

Current error F_i

The current error of a current transformer is (in %):

$$F_i = 100 \cdot \frac{K_N \cdot I_{sec} - I_{prim}}{I_{prim}}$$

K_N Rated transformation ratio
I_{prim} Actual primary current
I_{sec} Actual secondary current

Phase displacement d_i

The difference in phase between the primary and secondary current vectors, the direction of the vectors being so chosen that the angle is zero for a perfect transformer.

The phase displacement is said to be positive when the secondary current vector leads the primary current vector. It is usually expressed in minutes.

Limits of current error and phase displacement according to IEC 60044-1

Accuracy class	± current error in percent at rated current I_n				± phase displacement in minutes at rated current I_n			
	120 %	100 %	20 %	5 %	120 %	100 %	20 %	5 %
Measuring current transformers								
0.2	0.2	0.2	0.35	0.75	10	10	15	30
0.5	0.5	0.5	0.75	1.5	30	30	45	80
1	1	1	1.5	3	60	60	90	100
Protective current transformers								
5P	–	1	–	–	–	60	–	–
10P	–	3	–	–	–	–	–	–

1

Measuring current transformers

Current transformers provided for the connection of measuring instruments, meters and similar devices (e.g. 10 VA Cl. 0.5 FS5).

Rated instrument limit primary current

The value of the primary current at rated burden and a composite error of 10 %.

Instrument security factor n

The ratio of rated instrument limit primary current to the rated primary current

Note:

In the event of short-circuit currents flowing through the primary winding of a current transformer, the thermal stress to the measuring instruments supplied by the current transformer is smallest when the value of the rated instrument security factor is small.

Accuracy class

The limit of the percentage current error at rated current I_N (see table).

Generally, current transformers are used for a measuring range of 5 % to 120 % of the rated primary current.

Special designs

Extended current ratings

Current transformers with ext. 200 % can be continuously operated at 2 x I_N, and keep the error limits of their class in the range up to 200 % of the rated primary current.

Protective current transformers

Current transformers intended to supply protection relays (e.g. 15 VA Cl. 10 P 10).

Accuracy class (identification P)

The limit of the percentage current error for the rated accuracy limit primary current.

Rated accuracy limit primary current

The value of primary current up to which the transformer will comply with the requirements for composite error.

Accuracy limit factor

The ratio of the rated accuracy limit primary current to the rated primary current.

Multi-ratio current transformers

If the ratio of current transformers has to be variable, e.g. for planned switchgear extensions, it is possible to use multi-ratio current transformers.

Primary multi-ratio

Only possible for wound-primary transformers (transformers with several primary turns) with a ratio of 1:2 (e.g. 2 x 600 A/1 A). Reconnection is made by re-arrangement of copper lugs in the primary connection area. Ratings, instrument security factors as well as the secondary internal resistance remain constant during reconnection.

Secondary multi-ratio

In single-turn and wound-primary transformers, this can be implemented by taps of the secondary windings (e.g. 2000–1000 A/1 A).

Ratings or instrument security factors change almost linearly with the ratio. If not stated otherwise, the specified rated data is always referred to the lower current value.

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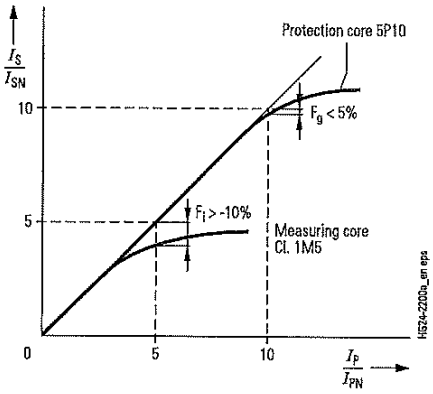
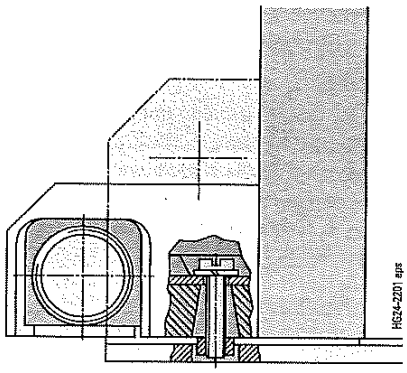


Overcurrent performance of current transformers when loaded with rated burden

F_i Current error
F_g Composite error



Earthing of the secondary winding, for example, in a 4MA7 current transformer

Performance in the event of overcurrent

In the event of an overcurrent, the rated secondary current increases proportionally with the rated primary current up to the rated instrument limit primary current.

The ratio of the rated instrument limit primary current to the rated primary current provides the instrument security factor assigned to the core. In accordance with this factor, the rated instrument limit primary current is subjected to specific error limits.

The measuring and protection cores place different demands on these error limits.

For measuring cores, the current error F_i is > −10 % in order to protect the supplied measuring devices, meters, etc. safely in case of overcurrent.

In protection cores, the composite error F_g is max. 5 % (5P) or 10 % (10P) in order to ensure the desired protection tripping.

The specified limits are only fulfilled at the rated burden of the transformer. If the operating burden differs from the rated burden of the transformer, the instrument security factor changes as follows:

$$n' = n \cdot \frac{Z_N + S_E}{S + S_E}$$

n' Actual instrument security factor
n Rated instrument security factor
Z_N Rated burden in VA
S_E Internal power consumption of the transformer in VA (approx. 5 % to 20 % of Z_N)
S Actually connected burden in VA

Operation and earthing

The secondary circuits of current transformers must never be open during operation, as dangerously high voltages can occur, especially at high currents and cores with high ratings.

All metal parts of a transformer that are not live, but accessible, must be earthed. Therefore, the transformers have earth connection points identified with the earthing symbol. Also, one terminal of the secondary winding (for current transformers, normally k or 1s, etc.) must be earthed.

For earthing the secondary windings, a thread is provided under each secondary terminal. The earth connection required is made by fitting a special screw.

1

Capacitively coupled voltage detecting system

The guidelines for every medium-voltage switchgear of the new generation state that doors and covers can only be opened when there is no risk of electric shock. The movable single-pole voltage testers used up to now are not suitable for this. Therefore, every medium-voltage switchgear is offered with a system including a fixed-mounted capacitive voltage divider.

The capacitive voltage detecting system consists of a capacitive divider which divides the voltage U between the phase L and earth into the partial voltages U_1 and U_2, and of an indicator applied to U_2. The indicator contains a glow lamp that flashes when voltage is applied.

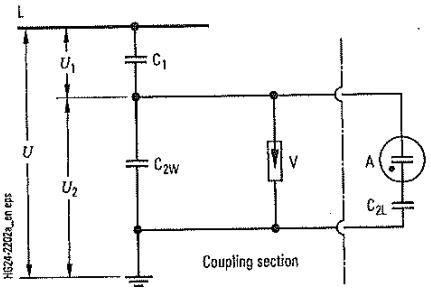
Indication range:
At 0.01 x U_N, no indication,
as of 0.40 x U_N, secure indication.

On request, support-type current transformers type 4MA7 can be delivered with capacitive layers for the voltage detecting system – then they contain a coupling electrode. This electrode is cast in a firm and protected way, and lead out at the secondary terminals with the designation CK. These current transformers are routine-tested additionally for compliance with the requested capacitance values (C_1 and C_{2W}). These values are documented on an additional label.

To ensure protection against electric shock even in the most improbable case that the current transformer punctures with the high-voltage capacitor (while an operator is touching the test sockets), a surge arrester is connected in parallel to this arrangement inside the transformer. If the high voltage is exceeded, it responds within nanoseconds, limiting the voltage at the test socket to harmless values.

Important for the ordering selection

When ordering transformers with capacitive layers it is necessary to state the actual operating voltage U_N (rated voltage), e.g. U_m = 24 kV, U_N = 15 kV.



Voltage detecting system

A Indicator
C_1 High-voltage capacitance (transformer)
C_{2W} Low-voltage capacitance (transformer)
C_{2L} Low-voltage capacitance (lead)
L High-voltage phase
U Voltage between phase and earth
U_1 Partial voltage at C_1
U_2 Partial voltage at C_2 and A
V Surge arrester

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Voltage transformers

Voltage transformers have only one magnet core, and are normally designed with one single secondary winding. If necessary, earthed (single-phase) voltage transformers are equipped with an additional residual voltage winding (earth-fault winding) beside the secondary winding (measuring winding).

In contrast to current transformers, voltage transformers must never be short-circuited on the secondary side. The earth-side terminal of the primary winding is effectively earthed in the terminal box, and must not be removed during operation.

Glossary of terms

Highest voltage for equipment U_m

The highest r.m.s. phase-to-phase voltage (in kV) for which a transformer is designed in respect of its insulation.

Rated voltage U_N

The voltage values (primary U_{PN} or secondary U_{SN}) stated on the rating plate of a transformer. If the voltage transformers are connected between phase and earth in three-phase systems, this phase-to-neutral voltage is considered the rated voltage. Except for the residual voltage winding, it is expressed as $U/\sqrt{3}$, with U being the phase-to-phase voltage.

U_m	Rated primary voltage	Rated secondary voltage
kV	kV	V
up to 52	3.3 3.6 4.8 5 6 6.6 7.2 10 11 13.8 15 17.5 20 22 30 33 35 40 45	100 110 120
	or the values divided by $\sqrt{3}$	or the values divided by $\sqrt{3}$

Rated transformation ratio K_N

The ratio of the rated primary voltage to the rated secondary voltage. It is expressed as unreduced fraction, e.g.

$10000/\sqrt{3}$ V / $100/\sqrt{3}$ V (single-phase)
10000 V/100 V (double-phase).

Voltage error F_U

The voltage error expressed in percent is defined by the formula:

$$F_U = 100 \cdot \frac{K_N \cdot U_{sec} - U_{prim}}{U_{prim}}$$

U_{prim} Actual primary voltage
U_{sec} Actual secondary voltage under measuring conditions when U_{prim} is applied

Phase displacement

The difference in phase between the primary voltage and the secondary voltage vectors, the direction of the vectors being so chosen that the angle is zero for a perfect transformer. The phase displacement is said to be positive when the secondary voltage vector leads the primary voltage vector. It is usually expressed in minutes.

Limits for voltage error and phase displacement according to IEC 60044-1

The voltage error and phase displacement at rated frequency shall not exceed the values given in the table at any voltage between 80 % and 120 % of rated voltage and with burdens of between 25 % and 100 % of rated burden at a power factor of 0.8 lagging.

Accuracy class	± voltage error	± phase displacement
	%	Minutes
0.2	0.2	10
0.5	0.5	20
1	1	40

Rated output S_N

The value of the apparent power (in VA at a specified power factor) which the transformer is intended to supply to the secondary circuit at the rated secondary voltage and with rated burden connected to it.

Preferred values:

Accuracy class	Rated output VA						
0.2	10	15	30	50	–	–	–
0.5	10	15	30	50	75	100	–
1	–	–	30	50	75	100	200

Thermal limiting output S_{th}

The value of the apparent power referred to rated voltage which can be taken from a secondary winding, at rated primary voltage applied, without exceeding the limits of temperature rise.

Thermal limiting output of the residual voltage winding

As the residual voltage winding is connected in broken delta, it is only stressed in case of fault. Therefore, the thermal limiting output of the residual voltage winding is referred to a stress duration of e.g. 8 h, and is expressed in VA.

Rated voltage factor

The multiplying factor to be applied to the rated primary voltage to determine the maximum voltage at which a transformer must comply with the relevant thermal requirements for a specified time and with the relevant accuracy requirements.

Multi-ratio

Voltage transformers for different rated primary voltages can only be reconnected on the secondary side for reasons of insulation.

Operation and earthing

In contrast to current transformers, voltage transformers must never be short-circuited on the secondary side. The earth-side primary terminal of earthed voltage transformers is insulated for a test voltage of 2 kV. It is connected to the earthed base plate in the terminal box.

Attention

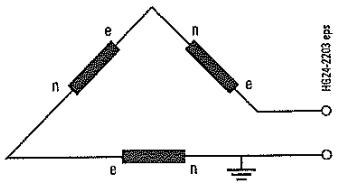
This connection must not be opened during operation.

Residual voltage windings connected in broken delta may only be earthed together at one point.

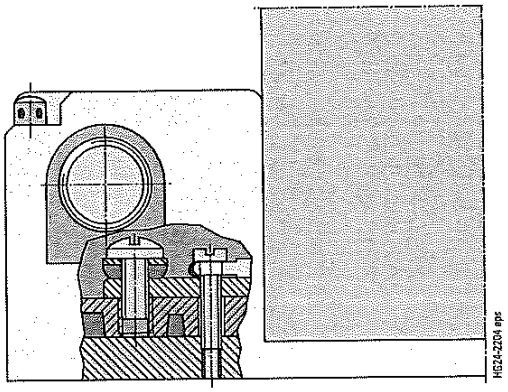
For earthing the secondary windings, a thread is provided under each secondary terminal. The earth connection required is established by fitting a special screw.

Relaxation oscillations

When single-phase voltage transformers are used in isolated systems, damping of the e–n windings connected in broken delta is recommended in order to avoid the possible destruction of the voltage transformers by relaxation oscillations.



Connection and earthing of the e–n or da–dn winding



Earthing of the secondary winding, for example, in a 4MR voltage transformer

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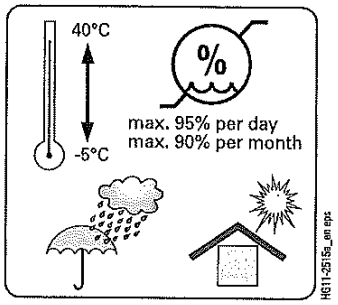

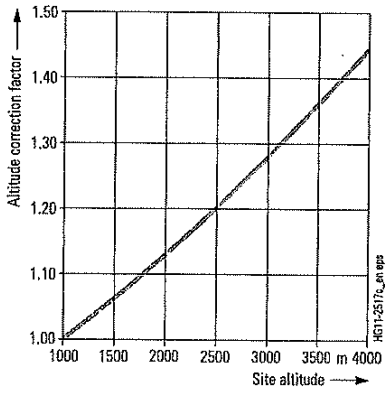

Highest voltage for equipment U_m	Rated short-duration power-frequency withstand voltage	Rated lightning impulse withstand voltage
kV	kV	V
7.2	20	60
12	28	75
17.5	38	95
24	50	125
36	70	170
52	95	250

Ambient conditions

The transformers are designed for the normal operating conditions defined in the standards.

The conditions shown opposite apply to indoor transformers. All indoor transformers are suitable for use with high air humidity and occasional condensation (e.g. in tropical areas).

As for outdoor transformers, the following conditions apply:

Minimum temperature

Outdoor transformers class 25	–25 °C
Outdoor transformers class 40	–40 °C

Relative air humidity

Outdoor transformers	up to 100 %

Dielectric strength

The dielectric strength of air insulation decreases with increasing altitude due to low air density. According to IEC 62271-1, the values of the rated lightning impulse withstand voltage and the rated short-duration power-frequency withstand voltage specified, among others, in the chapter "Technical Data" apply to a site altitude of 1000 m above sea level. For an altitude above 1000 m, the insulation level must be corrected according to the opposite diagram.

The characteristic shown applies to both rated withstand voltages.

To select the devices, the following applies:

$U \geq U_0 \times K_a$

U Rated withstand voltage under reference atmosphere
U_0 Rated withstand voltage requested for the place of installation
K_a Altitude correction factor according to the opposite diagram

Example

For a requested rated lightning impulse withstand voltage of 75 kV at an altitude of 2500 m, an insulation level of 90 kV under reference atmosphere is required as a minimum:

90 kV ≥ 75 kV x 1.2

Test voltages and insulation level for instrument transformers

Proper operation of the transformers is proved by the following tests:

- Impulse test (type test)
- Separate source withstand voltage test (routine test)
- Induced voltage withstand test (routine test)
- Partial discharge measurement (routine test)

All transformers correspond to insulation class E, i.e. the maximum temperature rise is 120 °C.

Partial discharge measurement

Apart from the tests mentioned on page 14, partial discharge measurements are required for current and voltage transformers to test the insulation. A partial discharge is to be understood as any small, brief electrical discharge appearing on or in a test object when voltage is applied. The discharges appear as soon as the partial discharge inception voltage of the insulating medium is exceeded at any point.

Relatively high field strengths appear at sharp edges and peaks of metal parts, or also on bubbles and gas inclusions in solid or liquid insulating materials.

Partial discharges act like HF emitters, producing a mixture of the most different frequencies. The partial discharge measurement enables an assessment about the homogeneity of the insulating material. Partial discharge measurements are performed as a routine test on inductive transformers with solid insulation as of $U_m = 3.6$ kV.

1

Type of earthing	Type of transformer	Pre-stressing voltage ≥ 10 s	Measuring voltage ≥ 1 min	Permissible partial discharge level Apparent load
Systems with isolated or impedance earthed neutral	Current transformers and earthed voltage transformers	$1.3\ U_m$	$1.1\ U_m$	250 pC
			$1.1\frac{U_m}{\sqrt{3}}$	50 pC
	Unearthed voltage transformers	$1.3\ U_m$	$1.1\ U_m$	50 pC
Systems with solidly earthed neutral	Current transformers and earthed voltage transformers	$0.8 \times 1.3\ U_m$	$1.1\frac{U_m}{\sqrt{3}}$	50 pC
	Unearthed voltage transformers	$1.3\ U_m$	$1.1\ U_m$	50 pC

Standards

Protective and measuring transformers conform to the following standards:

- VDE 0414 "Stipulations for instrument transformers"
- VDE 0111 "Insulation co-ordination for equipment in three-phase systems above 1 kV"
- IEC 60044-1
- IEC 60044-2
- ANSI 1675 (IEEE)
- DIN 42600

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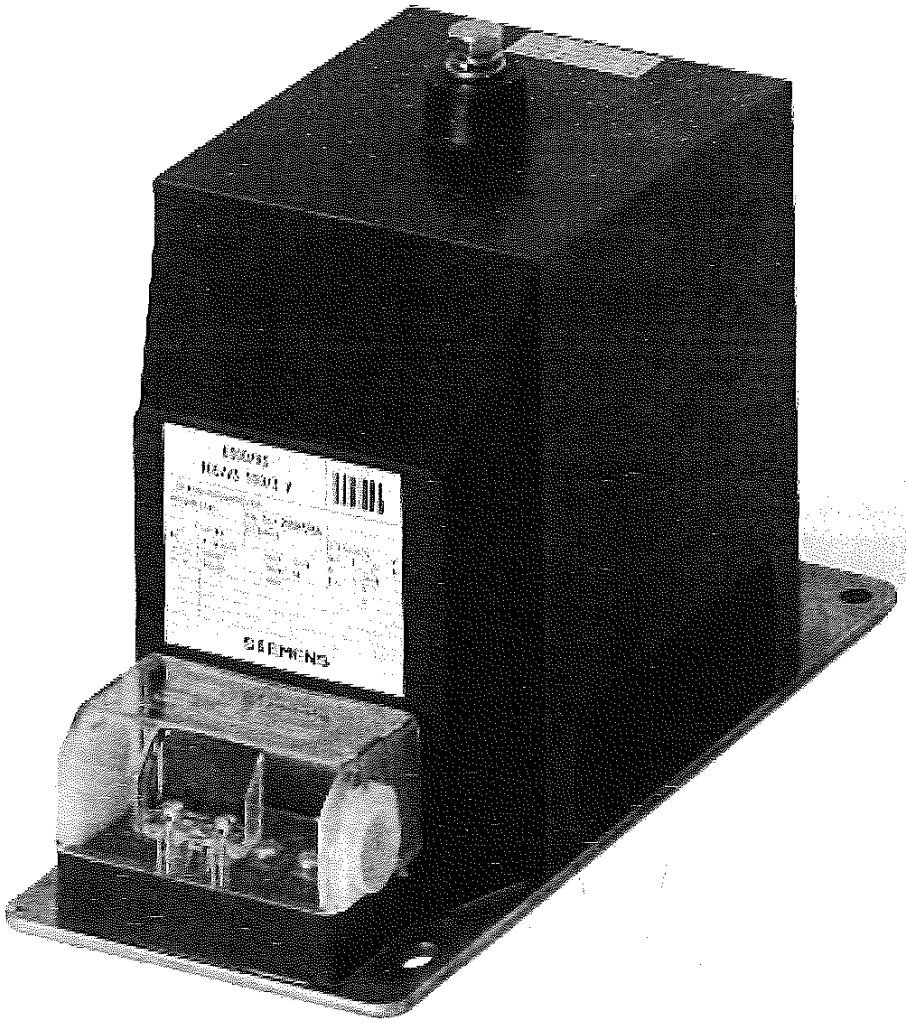

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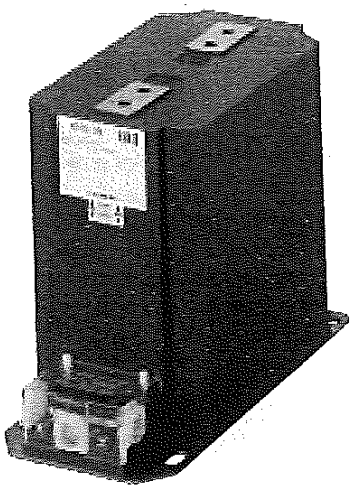
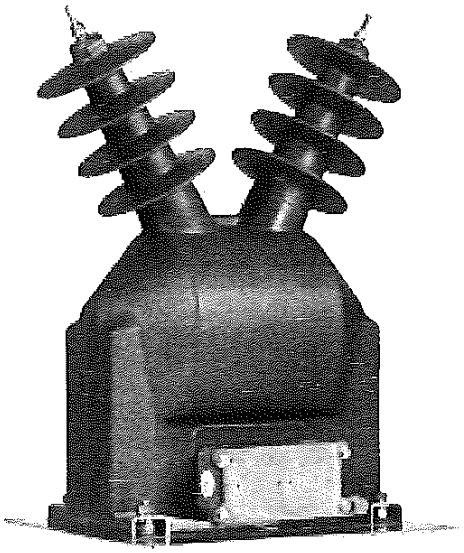


R-HG24-053.eps

4MA74 current transformer



R-HG24-058.eps

4MS6 outdoor voltage transformer

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Order number structure

Protective and measuring transformers are described by a 12 or 16-digit order number. The first five characters describe the type, design and application of the transformer (primary part), and the positions 6 to 12 or 6 to 16 identify the core data of the transformer.

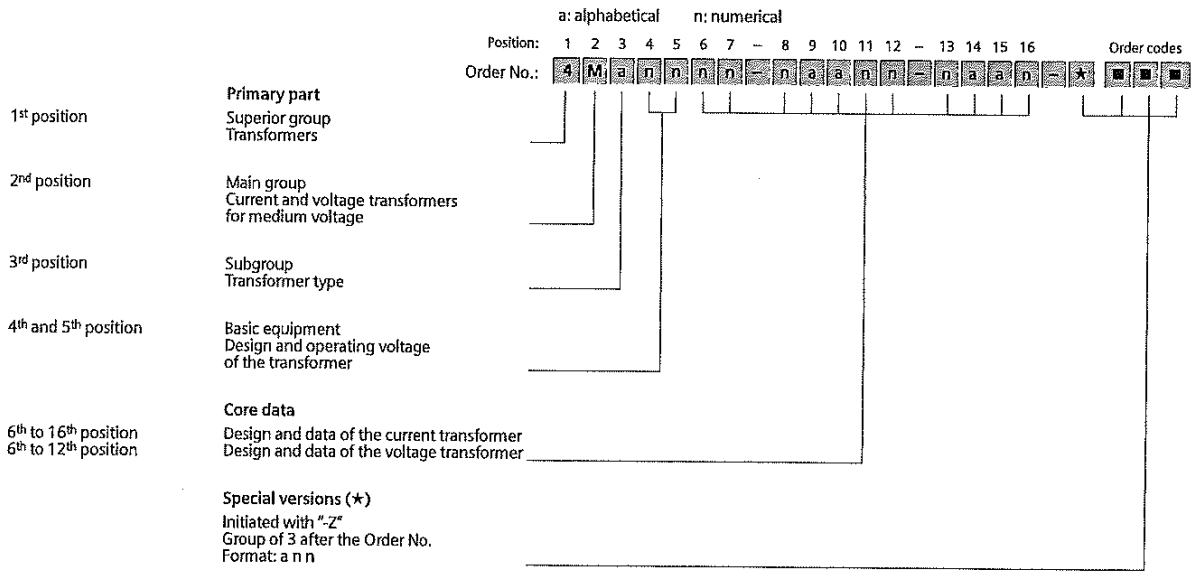
The transformers offered in the selection are only a part of the possible variations. If the transformer required is not shown, please clarify the feasibility with the responsible sales partner or the order processing department at the Switchgear Factory Berlin. The same applies to transformers according to the ANSI standard.

Order codes

Individual equipment versions, marked with **9** or **Z** in the 9th to 16th position, are explained more in detail by a 3-digit order code. Several order codes can be added to the order number in succession and in any sequence.

Built-on components and special versions (★)

For built-on components and special versions, "-Z" is added to the order number and a descriptive order code follows. If several built-on components and special versions are required, the suffix "-Z" is listed only once. If a requested special version is not in the catalog and can therefore not be ordered via order code, it has to be identified with **Y 9 9** after consultation. The agreement hereto is made directly between your responsible sales partner and the order processing department in the Switchgear Factory Berlin.



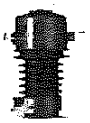
Configuration example

At the end of each of the following pages with selection data you will find a configuration example to make the order number structure more clear.
Starting from the last selection of the basic type, this example is continued, so that at the end of the equipment selection a completely configured and orderable transformer results for every product group.

On the foldout page we offer a configuring aid. Here you can fill in the order number you have determined for your transformer.

Example for Order No.: 4 M A 7 2 4 4 – ■ ■ ■ ■ ■ – ■ ■ ■ ■
Order codes:

Current transformer, type of construction according to IEC [1]

Illustration	Type of design	Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16	Order codes
		Order No.: 4 M ■ ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★	■ ■ ■
 R-HG24-056.eps	Indoor support-type current transformer, block-type design, small type according to DIN 42600, cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4 M A 7	Selection from page **20ff**
 R-HG24-060.eps	Indoor support-type current transformer, single-turn design, cast-resin insulated, operating voltage up to 12 kV or 24 kV	4 M B 1	Selection from page **41ff**
 R-HG24-051.eps	Indoor bushing-type current transformer, single-turn design, cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4 M C 2	Selection from page **44ff**
 R-HG24-054.eps	Indoor bar-primary bushing-type current transformer, cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4 M C 3	Selection from page **47ff**
 R-HG24-062.eps	Outdoor support-type current transformer, cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4 M E 2	Selection from page **53ff**
 R-HG24-071.eps	Outdoor support-type current transformer, top-assembly type, operating voltage up to 12 kV, 24 kV, 36 kV and 52 kV	4 M E 3	Selection from page **58ff**

1) Transformers according to ANSI standard on request

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Example for Order No.: 4 M A 7 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■

Order codes:

000172

4MA7 indoor support-type current transformer, block-type design

5th position
Operating voltage (maximum value)

Operating voltage U_m kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes Order No.:
12	75	28	4 M A 7 2
17.5	95	38	4 M A 7 2
24	125	50	4 M A 7 4
36	170	70	4 M A 7 6

See page 21 · See page 21 · See page 22 to page 39 · See page 40 · See page 40 · See page 40

– Z F 1 8

6th/7th position
Rated short-time thermal current

Rated short-time thermal current I_{th} kA	Remark	
8		3 3
12.5		4 0
16		4 4
20		4 8
25		5 4
31.5		5 7
40		6 3
50	Not for U_m = 36 kV	6 7
63	Not for U_m = 24 kV and U_m = 36 kV	7 1

Configuration example
Indoor support-type current transformer, block-type design
Maximum operating voltage U_m = 12 kV
Rated lightning impulse withstand voltage U_p = 75 kV
Rated short-duration power-frequency withstand voltage U_d = 28 kV
Rated short-time thermal current I_{th} = 16 kA

4 M A 7 2 4 4

Example for Order No.: 4 M A 7 2 4 4 – ■ ■ ■ ■ ■ – ■ ■ ■ ■
Order codes:

8th/9th position
Rated primary current

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 — Order codes

Order No.: 4 M A 7 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ – ★ ■ ■ ■

Rated primary current I_{PN} A	Rated primary current, with primary multi-ratio I_{PN} A	Rated short-time thermal current I_{th} 8 kA	12.5 kA	16 kA	20 kA	25 kA	31.5 kA	40 kA	50 kA	63 kA	8th/9th position
20		■	■	■							0 E
25		■	■	■	■						0 F
30		■	■	■	■						0 G
40		■	■	■	■	■	■				0 H
50		■	■	■	■	■	■	■			0 J
60		■	■	■	■	■	■	■	■		0 K
75		■	■	■	■	■	■	■	■	■	0 L
100		■	■	■	■	■	■	■	■	■	0 M
125		■	■	■	■	■	■	■	■	■	0 N
150		■	■	■	■	■	■	■	■	■	0 P
200		■	■	■	■	■	■	■	■	■	0 Q
250		■	■	■	■	■	■	■	■	■	0 R
300		■	■	■	■	■	■	■	■	■	0 S
400		■	■	■	■	■	■	■	■	■	0 T
500		■	■	■	■	■	■	■	■	■	0 U
600		■	■	■	■	■	■	■	■	■	0 V
750		■	■	■	■	■	■	■	■	■	0 W
800				■							0 X
1000		■	■	■	■	■	■	■	■	■	1 A
1200		■	■	■	■	■	■	■	■	■	1 B
1250		■	■	■	■	■	■	■	■	■	1 C
1500		■	■	■	■	■	■	■	■	■	1 D
2000		■	■	■	■	■	■	■	■	■	1 F
2500		■	■	■	■	■	■	■	■	■	1 G
	2x 20	■	■	■							3 E
	2x 25	■	■	■	■						3 F
	2x 30	■	■	■	■						3 G
	2x 40	■	■	■	■	■	■				3 H
	2x 50	■	■	■	■	■	■	■			3 J
	2x 60	■	■	■	■	■	■	■	■		3 K
	2x 75	■	■	■	■	■	■	■	■	■	3 L
	2x 100	■	■	■	■	■	■	■	■	■	3 M
	2x 125	■	■	■	■	■	■	■	■	■	3 N
	2x 150	■	■	■	■	■	■	■	■	■	3 P
	2x 200	■	■	■	■	■	■	■	■	■	3 Q
	2x 250	■	■	■	■	■	■	■	■	■	3 R
	2x 300	■	■	■	■	■	■	■	■	■	3 S
	2x 400	■	■	■	■	■	■	■	■	■	3 T
	2x 500	■	■	■	■	■	■	■	■	■	3 U
	2x 600	■	■	■	■	■	■	■	■	■	3 V

See page 22 to page 39 | See page 40 | See page 40 | See page 40

■ Feasible (other combinations on request)

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ВЯРНО С ОРИГИНАЛА
MIG 23 EOOД · MIG 23 LTD · СОФИЯ

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, U_p = 75 kV, U_d = 28 kV, I_{th} = 16 kA)
Rated primary current I_{PN} = 100 A

4 M A 7 2 4 4 – 0 M

Example for Order No.: 4 M A 7 2 4 4 – 0 M ■ ■ ■ – ■ ■ ■ ■

Order codes:

000173

2

8 kA

10th to 14th position
Core versions

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes
Order No.: 4 M A 7 ■ 3 3 – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■
(15, 16: s. p. 40; ★: s. p. 40)

At rated primary current I_{PN}	Thermal strength	Position 12
100 A 125 A 150 A 200 A 250 A 300 A 400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
60 A 75 A	150 x I_{PN}	1
40 A 50 A	200 x I_{PN}	2
30 A	300 x I_{PN}	3
20 A 25 A	400 x I_{PN}	4

1st core Class	1st core Factor	1st core VA rating	2nd core Class	2nd core Factor	2nd core VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	Order No. pos. 10–14
0.2	FS10	10								■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10								■	■	■	■	■	E 2 – 0 A
		15								■	■	■	■	■	E 3 – 0 A
		30								■	■	■	■	■	E 4 – 0 A
1	FS5	10								■	■	■	■	■	H 2 – 0 A
		15								■	■	■	■	■	H 3 – 0 A
		30								■	■	■	■	■	H 4 – 0 A
5P	10	5								■	■	■	■	■	L 1 – 0 A
		10								■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5								■	■	■	■	■	Q 1 – 0 A
		10								■	■	■	■	■	Q 2 – 0 A
		15								■	■	■	■	■	Q 3 – 0 A
		30									■	■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5					■	■	■	■	■	E 1 – 1 L
		10			10					■	■	■	■	■	E 2 – 2 L
		15			15								■	■	E 3 – 3 L
		30			30								■	■	E 4 – 4 L
0.5	FS5	5	10P	10	5					■	■	■	■	■	E 1 – 1 Q
		10			10					■	■	■	■	■	E 2 – 2 Q
		15			15								■	■	E 3 – 3 Q
		30			30								■	■	E 4 – 4 Q
1	FS5	5	5P	10	5					■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15						■	■	■	■	H 2 – 3 L
		15			15							■	■	■	H 3 – 3 L
		15			30								■	■	H 3 – 4 L
		30			30								■	■	H 4 – 4 L
1	FS5	5	10P	10	5					■	■	■	■	■	H 1 – 1 Q
		10			10					■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15							■	■	■	H 3 – 3 Q
		15			30							■	■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design 4 M A 7
(U_m = 12 kV, I_{th} = 8 kA, I_{PN} = 100 A) 2 3 3 – 0 M
Thermal strength 100 x I_{PN} 0
1st core class 5P; instrument security factor 10; rating 30 VA
2nd core without L 4 – 0 A

Example for Order No.: 4 M A 7 2 3 3 – 0 M L 4 0 – 0 A ■ ■
Order codes:

8 kA – with primary multi-ratio

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength	Position: 10	Order No.:
2x 100 A 2x 125 A 2x 150 A 2x 200 A 2x 250 A 2x 300 A 2x 400 A 2x 500 A 2x 600 A	100 x I_{PN}	0	
2x 60 A 2x 75 A	150 x I_{PN}	1	
2x 40 A 2x 50 A	200 x I_{PN}	2	
2x 30 A	300 x I_{PN}	3	
2x 20 A 2x 25 A	400 x I_{PN}	4	

1st core			2nd core			Thermal strength								11	12	13	14	15	16		
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}							
0.2	FS10	10								■	■	■	■	■	C	2	–	0	A
		15								■	■	■	■	■	C	3	–	0	A
0.5	FS5	10								■	■	■	■	■	E	2	–	0	A
		15								■	■	■	■	■	E	3	–	0	A
		30								■	■	■	■	■	E	4	–	0	A
1	FS5	10								■	■	■	■	■	H	2	–	0	A
		15								■	■	■	■	■	H	3	–	0	A
		30								■	■	■	■	■	H	4	–	0	A
5P	10	5								■	■	■	■	■	L	1	–	0	A
		10								■	■	■	■	■	L	2	–	0	A
		15								■	■	■	■	■	L	3	–	0	A
		30										■	■	■	L	4	–	0	A
10P	10	5								■	■	■	■	■	Q	1	–	0	A
		10								■	■	■	■	■	Q	2	–	0	A
		15								■	■	■	■	■	Q	3	–	0	A
		30									■	■	■	■	Q	4	–	0	A
0.5	FS5	5	5P	10	5					■	■	■	■	■	E	1	–	1	L
		10			10							■	■	■	E	2	–	2	L
		15			15							□	■	■	E	3	–	3	L
		30			30								■	■	E	4	–	4	L
0.5	FS5	5	10P	10	5					■	■	■	■	■	E	1	–	1	Q
		10			10							■	■	■	E	2	–	2	Q
		15			15								■	■	E	3	–	3	Q
		30			30								■	■	E	4	–	4	Q
1	FS5	5	5P	10	5					■	■	■	■	■	H	1	–	1	L
		10			10					■	■	■	■	■	H	2	–	2	L
		10			15						■	■	■	■	H	2	–	3	L
		15			15							■	■	■	H	3	–	3	L
		15			30							□	■	■	H	3	–	4	L
		30			30								■	■	H	4	–	4	L
1	FS5	5	10P	10	5					■	■	■	■	■	H	1	–	1	Q
		10			10					■	■	■	■	■	H	2	–	2	Q
		10			15						■	■	■	■	H	2	–	3	Q
		15			15							■	■	■	H	3	–	3	Q
		15			30							□	■	■	H	3	–	4	Q
		30			30								■	■	H	4	–	4	Q

■ Feasible (other combinations on request) □ Not for 2x 40 A

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 8 kA, I_{PN} = 2x 100 A)
Thermal strength 100 x I_{PN}
1st core class 1; instrument security factor FS5; rating 15 VA
2nd core class 10P; accuracy limit factor 10; rating 30 VA

	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes
Example for Order No.:	4	M	A	7	2	3	3	–	3	M			0							
Order codes:																				

ВЯРНО С ОРИГИНАЛА
МКГ 23 ЕООД · СОФИЯ · MIG 23 LTD ·

12.5 kA

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength	Position 12
125 A 150 A 200 A 250 A 300 A 400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
100 A	150 x I_{PN}	1
75 A	200 x I_{PN}	2
50 A 60 A	300 x I_{PN}	3
40 A	400 x I_{PN}	4
25 A 30 A	500 x I_{PN}	5
20 A	800 x I_{PN}	7

1st core			2nd core			Thermal strength										Position 11
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}		
0.2	FS10	10							■	■	■	■	■	■	C	2
		15							■	■	■	■	■	■	C	3
0.5	FS5	10					■		■	■	■	■	■	■	E	2
		15					■		■	■	■	■	■	■	E	3
		30							■	■	■	■	■	■	E	4
1	FS5	10					■		■	■	■	■	■	■	H	2
		15					■		■	■	■	■	■	■	H	3
		30							■	■	■	■	■	■	H	4
5P	10	5					■		■	■	■	■	■	■	L	1
		10							■	■	■	■	■	■	L	2
		15								■	■	■	■	■	L	3
		30										■	■	■	L	4
10P	10	5					■		■	■	■	■	■	■	Q	1
		10					■		■	■	■	■	■	■	Q	2
		15							■	■	■	■	■	■	Q	3
		30									■	■	■	■	Q	4
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E	1
		10			10				■	■	■	■	■	■	E	2
		15			15							■	■	■	E	3
		30			30								■	■	E	4
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E	1
		10			10				■	■	■	■	■	■	E	2
		15			15						■	■	■	■	E	3
		30			30								■	■	E	4
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H	1
		10			10				■	■	■	■	■	■	H	2
		10			15					■	■	■	■	■	H	2
		15			15					■	■	■	■	■	H	3
		15			30						■	■	■	■	H	3
		30			30							■	■	■	H	4
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H	1
		10			10				■	■	■	■	■	■	H	2
		10			15					■	■	■	■	■	H	2
		15			15					■	■	■	■	■	H	3
		15			30						■	■	■	■	H	3
		30			30							■	■	■	H	4

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 12.5 kA, I_{PN} = 100 A)
Thermal strength 150 x I_{PN}
1st core class 10P; instrument security factor 10; rating 5 VA
2nd core without

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes
Order No.:	4	M	A	7	■	4	0	–	■	■	■	■	■	–	■	■	■	■	–	■ ■ ■
																	s. p. 40	s. p. 40	s. p. 40	
Example for Order No.:	4	M	A	7	2	4	0	–	0	M	Q	1	1	–	0	A	■	■		
Order codes:																				

12.5 kA – with primary multi-ratio

10th to 14th position
Core versions

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes
Order No.: 4 M A 7 ■ 4 0 – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

s. p. 40 s. p. 40 s. p. 40

At rated primary current I_{PN}	Thermal strength	
2x 125 A 2x 150 A 2x 200 A 2x 250 A 2x 300 A 2x 400 A 2x 500 A 2x 600 A	100 x I_{PN}	0
2x 100 A	150 x I_{PN}	1
2x 75 A	200 x I_{PN}	2
2x 50 A 2x 60 A	300 x I_{PN}	3
2x 40 A	400 x I_{PN}	4
2x 25 A 2x 30 A	500 x I_{PN}	5
2x 20 A	800 x I_{PN}	7

1st core			2nd core			Thermal strength								
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	
0.2	FS10	10								■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10					■		■	■	■	■	■	■	E 2 – 0 A
		15							■	■	■	■	■	■	E 3 – 0 A
		30								■	■	■	■	■	E 4 – 0 A
1	FS5	10					■		■	■	■	■	■	■	H 2 – 0 A
		15					■		■	■	■	■	■	■	H 3 – 0 A
		30							■	■	■	■	■	■	H 4 – 0 A
5P	10	5					■		■	■	■	■	■	■	L 1 – 0 A
		10							■	■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30									■	■	■	■	L 4 – 0 A
10P	10	5					■		■	■	■	■	■	■	Q 1 – 0 A
		10					■		■	■	■	■	■	■	Q 2 – 0 A
		15							■	■	■	■	■	■	Q 3 – 0 A
		30									■	■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E 1 – 1 L
		10			10						■	■	■	■	E 2 – 2 L
		15			15							■	■	■	E 3 – 3 L
		30			30								■	■	E 4 – 4 L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E 1 – 1 Q
		10			10						■	■	■	■	E 2 – 2 Q
		15			15							■	■	■	E 3 – 3 Q
		30			30								■	■	E 4 – 4 Q
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H 1 – 1 L
		10			10				■	■	■	■	■	■	H 2 – 2 L
		10			15					■	■	■	■	■	H 2 – 3 L
		15			15					■	■	■	■	■	H 3 – 3 L
		15			30						■	■	■	■	H 3 – 4 L
		30			30							■	■	■	H 4 – 4 L
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H 1 – 1 Q
		10			10				■	■	■	■	■	■	H 2 – 2 Q
		10			15					■	■	■	■	■	H 2 – 3 Q
		15			15					■	■	■	■	■	H 3 – 3 Q
		15			30						■	■	■	■	H 3 – 4 Q
		30			30							■	■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 12.5 kA, I_{PN} = 2x 100 A)
Thermal strength 150 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 15 VA
2nd core class 10P; accuracy limit factor 10; rating 15 VA

4 M A 7 2 4 0 – 3 M E 3 1 – 3 Q

Example for Order No.: 4 M A 7 2 4 0 – 3 M E 3 1 – 3 Q
Order codes:

ВЯРНО С ОРИГИНАЛА

МИГ 23 ЕООД · СОФИЯ · MIG 23 LTD

000175

16 kA

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength	Position: 10 11 12	Order No.:
200 A 250 A 300 A 400 A 500 A 600 A 750 A 800 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0	
125 A 150 A	150 x I_{PN}	1	
100 A	200 x I_{PN}	2	
60 A 75 A	300 x I_{PN}	3	
40 A 50 A	400 x I_{PN}	4	
30 A	600 x I_{PN}	6	
25 A	800 x I_{PN}	7	
20 A	1000 x I_{PN}	8	

1st core			2nd core			Thermal strength								10 11 12 – 13 14 15 16	
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	
0.2	FS10	10								■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10					■	■	■	■	■	■	■	■	E 2 – 0 A
		15						■	■	■	■	■	■	■	E 3 – 0 A
		30								■	■	■	■	■	E 4 – 0 A
1	FS5	10					■	■	■	■	■	■	■	■	H 2 – 0 A
		15					■	■	■	■	■	■	■	■	H 3 – 0 A
		30							■	■	■	■	■	■	H 4 – 0 A
5P	10	5					■	■	■	■	■	■	■	■	L 1 – 0 A
		10							■	■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5					■	■	■	■	■	■	■	■	Q 1 – 0 A
		10					■	■	■	■	■	■	■	■	Q 2 – 0 A
		15							■	■	■	■	■	■	Q 3 – 0 A
		30									■	■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5			■	■	■	■	■	■	■	E 1 – 1 L
		10			10				■	■	■	■	■	■	E 2 – 2 L
		15			15						■	■	■	■	E 3 – 3 L
		30			30							■	■	■	E 4 – 4 L
0.5	FS5	5	10P	10	5			■	■	■	■	■	■	■	E 1 – 1 Q
		10			10					■	■	■	■	■	E 2 – 2 Q
		15			15						■	■	■	■	E 3 – 3 Q
		30			30							■	■	■	E 4 – 4 Q
1	FS5	5	5P	10	5	■	■	■	■	■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15						■	■	■	■	H 2 – 3 L
		15			15						■	■	■	■	H 3 – 3 L
		15			30							■	■	■	H 3 – 4 L
		30			30							■	■	■	H 4 – 4 L
1	FS5	5	10P	10	5	■	■	■	■	■	■	■	■	■	H 1 – 1 Q
		10			10					■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15						■	■	■	■	H 3 – 3 Q
		15			30							■	■	■	H 3 – 4 Q
		30			30							■	■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 16 kA, I_{PN} = 100 A)
Thermal strength 200 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 10 VA
2nd core class 5P; accuracy limit factor 10; rating 10 VA

Example for Order No.: 4 M A 7 2 4 4 – 0 M E 2 2 – 2 L
Order codes:

16 kA – with primary multi-ratio

10th to 14th position
Core versions

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes
Order No.: 4 M A 7 ■ 4 4 – ■ ■ ■ ■ ■ – ■ ■ ■ – ★ ■ ■ ■
s. p. 40 s. p. 40 s. p. 40

At rated primary current I_{PN}	Thermal strength	
2x 200 A 2x 250 A 2x 300 A 2x 400 A 2x 500 A 2x 600 A	100 x I_{PN}	0
2x 125 A 2x 150 A	150 x I_{PN}	1
2x 100 A	200 x I_{PN}	2
2x 60 A 2x 75 A	300 x I_{PN}	3
2x 40 A 2x 50 A	400 x I_{PN}	4
2x 30 A	600 x I_{PN}	6
2x 25 A	800 x I_{PN}	7
2x 20 A	1000 x I_{PN}	8

1st core			2nd core			Thermal strength									
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	
0.2	FS10	10								■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10				■	■	■		■	■	■	■	■	E 2 – 0 A
		15						■		■	■	■	■	■	E 3 – 0 A
		30								■	■	■	■	■	E 4 – 0 A
1	FS5	10				■	■	■		■	■	■	■	■	H 2 – 0 A
		15				■	■	■		■	■	■	■	■	H 3 – 0 A
		30								■	■	■	■	■	H 4 – 0 A
5P	10	5				■	■	■		■	■	■	■	■	L 1 – 0 A
		10						■		■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30									■	■	■	■	L 4 – 0 A
10P	10	5				■	■	■		■	■	■	■	■	Q 1 – 0 A
		10				■	■	■		■	■	■	■	■	Q 2 – 0 A
		15						■		■	■	■	■	■	Q 3 – 0 A
		30									■	■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5			■		■	■	■	■	■	E 1 – 1 L
		10			10					■	■	■	■	■	E 2 – 2 L
		15			15						■	■	■	■	E 3 – 3 L
		30			30								■	■	E 4 – 4 L
0.5	FS5	5	10P	10	5			■		■	■	■	■	■	E 1 – 1 Q
		10			10					■	■	■	■	■	E 2 – 2 Q
		15			15						■	■	■	■	E 3 – 3 Q
		30			30								■	■	E 4 – 4 Q
1	FS5	5	5P	10	5	■	■	■		■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15						■	■	■	■	H 2 – 3 L
		15			15						■	■	■	■	H 3 – 3 L
		15			30							■	■	■	H 3 – 4 L
		30			30								■	■	H 4 – 4 L
1	FS5	5	10P	10	5	■	■	■		■	■	■	■	■	H 1 – 1 Q
		10			10					■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15						■	■	■	■	H 3 – 3 Q
		15			30							■	■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 16 kA, I_{PN} = 2x 100 A)
Thermal strength 200 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 10 VA
2nd core without

4 M A 7 2 4 4 – 3 M 2 E 2 – 0 A

Example for Order No.: 4 M A 7 2 4 4 – 3 M E 2 – 0 A ■ ■
Order codes:

МИГ 23 ЕООД · MIG 23 LTD · СОФИЯ
ВЯРНО С ОРИГИНАЛА

000176

20 kA

10th to 14th position

Core versions

At rated primary current I_{PN}	Thermal strength	Position 12
200 A 250 A 300 A 400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
150 A	150 x I_{PN}	1
100 A 125 A	200 x I_{PN}	2
75 A	300 x I_{PN}	3
50 A 60 A	400 x I_{PN}	4
40 A	500 x I_{PN}	5
30 A	800 x I_{PN}	7
25 A	1000 x I_{PN}	8

1st core			2nd core			Thermal strength								Position 10	11	13	14	15	16
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}					
0.2	FS10	10					■		■	■	■	■	■	■	C	2	–	0	A
		15								■	■	■	■	■	C	3	–	0	A
0.5	FS5	10				■	■		■	■	■	■	■	■	E	2	–	0	A
		15					■		■	■	■	■	■	■	E	3	–	0	A
		30							■	■	■	■	■	■	E	4	–	0	A
1	FS5	10				■	■		■	■	■	■	■	■	H	2	–	0	A
		15				■	■		■	■	■	■	■	■	H	3	–	0	A
		30							■	■	■	■	■	■	H	4	–	0	A
5P	10	5				■	■		■	■	■	■	■	■	L	1	–	0	A
		10							■	■	■	■	■	■	L	2	–	0	A
		15								■	■	■	■	■	L	3	–	0	A
		30										■	■	■	L	4	–	0	A
10P	10	5				■	■		■	■	■	■	■	■	Q	1	–	0	A
		10				■	■		■	■	■	■	■	■	Q	2	–	0	A
		15							■	■	■	■	■	■	Q	3	–	0	A
		30									■	■	■	■	Q	4	–	0	A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E	1	–	1	L
		10			10					■	■	■	■	■	E	2	–	2	L
		15			15						■	■	■	■	E	3	–	3	L
		30			30									■	E	4	–	4	L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E	1	–	1	Q
		10			10					■	■	■	■	■	E	2	–	2	Q
		15			15						■	■	■	■	E	3	–	3	Q
		30			30									■	E	4	–	4	Q
1	FS5	5	5P	10	5	■	■		■	■	■	■	■	■	H	1	–	1	L
		10			10					■	■	■	■	■	H	2	–	2	L
		10			15						■	■	■	■	H	2	–	3	L
		15			15						■	■	■	■	H	3	–	3	L
		15			30								■	■	H	3	–	4	L
		30			30									■	H	4	–	4	L
1	FS5	5	10P	10	5	■	■		■	■	■	■	■	■	H	1	–	1	Q
		10			10				■	■	■	■	■	■	H	2	–	2	Q
		10			15						■	■	■	■	H	2	–	3	Q
		15			15						■	■	■	■	H	3	–	3	Q
		15			30								■	■	H	3	–	4	Q
		30			30									■	H	4	–	4	Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 20 kA, I_{PN} = 100 A)
Thermal strength 200 x I_{PN}
1st core class 1; instrument security factor FS5; rating 10 VA
2nd core class 5P; accuracy limit factor 10; rating 15 VA

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes
Order No.:	4	M	A	7	■	4	8	–	■	■	■	■	■	–	■	■	■	■	–	■ ■ ■
																	s. p. 40	s. p. 40	s. p. 40	
Example for Order No.:	4	M	A	7	2	4	8	–	0	M	H	2	2	–	3	L	■	■		
Order codes:																				

20 kA – with primary multi-ratio

10th to 14th position
Core versions

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes
Order No.: 4 M A 7 ■ 4 8 – ■ ■ ■ ■ ■ – ■ ■ ■ s. p. 40 s. p. 40 – ★ s. p. 40 ■ ■

At rated primary current I_{PN}	Thermal strength	
2x 200 A 2x 250 A 2x 300 A 2x 400 A 2x 500 A 2x 600 A	100 x I_{PN}	0
2x 150 A	150 x I_{PN}	1
2x 100 A 2x 125 A	200 x I_{PN}	2
2x 75 A	300 x I_{PN}	3
2x 50 A 2x 60 A	400 x I_{PN}	4
2x 40 A	500 x I_{PN}	5
2x 30 A	800 x I_{PN}	7
2x 25 A	1000 x I_{PN}	8

1st core			2nd core			Thermal strength									
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	
0.2	FS10	10							■	■	■	■	■	■	C 2 – 0 A
		15							■	■	■	■	■	■	C 3 – 0 A
0.5	FS5	10				■	■		■	■	■	■	■	■	E 2 – 0 A
		15							■	■	■	■	■	■	E 3 – 0 A
		30								■	■	■	■	■	E 4 – 0 A
1	FS5	10				■	■		■	■	■	■	■	■	H 2 – 0 A
		15				■	■		■	■	■	■	■	■	H 3 – 0 A
		30							■	■	■	■	■	■	H 4 – 0 A
5P	10	5				■	■		■	■	■	■	■	■	L 1 – 0 A
		10							■	■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30									■	■	■	■	L 4 – 0 A
10P	10	5				■	■		■	■	■	■	■	■	Q 1 – 0 A
		10					■		■	■	■	■	■	■	Q 2 – 0 A
		15							■	■	■	■	■	■	Q 3 – 0 A
		30									■	■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5				■	■	■	■	■	■	E 1 – 1 L
		10			10						■	■	■	■	E 2 – 2 L
		15			15						■	■	■	■	E 3 – 3 L
		30			30							■	■	■	E 4 – 4 L
0.5	FS5	5	10P	10	5				■	■	■	■	■	■	E 1 – 1 Q
		10			10				■		■	■	■	■	E 2 – 2 Q
		15			15						■	■	■	■	E 3 – 3 Q
		30			30							■	■	■	E 4 – 4 Q
1	FS5	5	5P	10	5	■	■		■	■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15						■	■	■	■	H 2 – 3 L
		15			15						■	■	■	■	H 3 – 3 L
		15			30							■	■	■	H 3 – 4 L
		30			30							■	■	■	H 4 – 4 L
1	FS5	5	10P	10	5	■	■		■	■	■	■	■	■	H 1 – 1 Q
		10			10					■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15						■	■	■	■	H 3 – 3 Q
		15			30							■	■	■	H 3 – 4 Q
		30			30							■	■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 20 kA, I_{PN} = 2x 100 A)
Thermal strength 200 x I_{PN}
1st core class 1; instrument security factor FS5; rating 5 VA
2nd core class 10P; accuracy limit factor 10; rating 5 VA

4 M A 7 2 4 8 – 3 M 2 H 1 – 1 Q

Example for Order No.: 4 M A 7 2 4 8 – 3 M H 1 2 – 1 Q ■ ■
Order codes:

МИГ 23 ЕООД · MIG 23 LTD · СОФИЯ
ВЯРНО С ОРИГИНАЛА

2

0001

Equipment Selection

4MA7 indoor support-type current transformer, block-type design

25 kA

10th to 14th position

Core versions

At rated primary current I_{PN}	Thermal strength
250 A 300 A 400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}
200 A	150 x I_{PN}
125 A 150 A	200 x I_{PN}
100 A	300 x I_{PN}
75 A	400 x I_{PN}
50 A 60 A	500 x I_{PN}
40 A	800 x I_{PN}

1st core			2nd core			Thermal strength							
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}
0.2	FS10	10							■	■	■	■	■	■
		15								■	■	■	■	■
0.5	FS5	10					■		■	■	■	■	■	■
		15							■	■	■	■	■	■
		30							■	■	■	■	■	■
1	FS5	10					■		■	■	■	■	■	■
		15					■		■	■	■	■	■	■
		30							■	■	■	■	■	■
5P	10	5					■		■	■	■	■	■	■
		10							■	■	■	■	■	■
		15								■	■	■	■	■
		30									■	■	■	■
10P	10	5					■		■	■	■	■	■	■
		10					■		■	■	■	■	■	■
		15							■	■	■	■	■	■
		30									■	■	■	■
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■
		10			10					■	■	■	■	■
		15			15						■	■	■	■
		30			30									■
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■
		10			10					■	■	■	■	■
		15			15						■	■	■	■
		30			30									■
1	FS5	5	5P	10	5		■		■	■	■	■	■	■
		10			10					■	■	■	■	■
		10			15						■	■	■	■
		15			15						■	■	■	■
		15			30								■	■
		30			30									■
1	FS5	5	10P	10	5		■		■	■	■	■	■	■
		10			10				■	■	■	■	■	■
		10			15						■	■	■	■
		15			15						■	■	■	■
		15			30								■	■
		30			30									■

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 25 kA, I_{PN} = 100 A)
Thermal strength 300 x I_{PN}
1st core class 10P; instrument security factor 10; rating 15 VA
2nd core without

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes
Order No.:	4	M	A	7	■	5	4	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■
																	s. p. 40	s. p. 40		s. p. 40	

10	11	12	13	14	15	16
		0				
		1				
		2				
		3				
		4				
		5				
		7				
C	2		–	0	A	
C	3		–	0	A	
E	2		–	0	A	
E	3		–	0	A	
E	4		–	0	A	
H	2		–	0	A	
H	3		–	0	A	
H	4		–	0	A	
L	1		–	0	A	
L	2		–	0	A	
L	3		–	0	A	
L	4		–	0	A	
Q	1		–	0	A	
Q	2		–	0	A	
Q	3		–	0	A	
Q	4		–	0	A	
E	1		–	1	L	
E	2		–	2	L	
E	3		–	3	L	
E	4		–	4	L	
E	1		–	1	Q	
E	2		–	2	Q	
E	3		–	3	Q	
E	4		–	4	Q	
H	1		–	1	L	
H	2		–	2	L	
H	2		–	3	L	
H	3		–	3	L	
H	3		–	4	L	
H	4		–	4	L	
H	1		–	1	Q	
H	2		–	2	Q	
H	2		–	3	Q	
H	3		–	3	Q	
H	3		–	4	Q	
H	4		–	4	Q	

4 M A 7 2 5 4 – 0 M 3 Q 3 – 0 A

Example for Order No.: 4 M A 7 2 5 4 – 0 M Q 3 3 – 0 A ■ ■

Order codes:

25 kA – with primary multi-ratio

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength
2x 250 A 2x 300 A 2x 400 A 2x 500 A 2x 600 A	100 x I_{PN}
2x 200 A	150 x I_{PN}
2x 125 A 2x 150 A	200 x I_{PN}
2x 100 A	300 x I_{PN}
2x 75 A	400 x I_{PN}
2x 50 A 2x 60 A	500 x I_{PN}
2x 40 A	800 x I_{PN}

1st core			2nd core			Thermal strength									
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	12
0.2	FS10	10							■	■	■	■	■	■	C 2 – 0 A
		15								■	■	■	■	■	C 3 – 0 A
0.5	FS5	10					■		■	■	■	■	■	■	E 2 – 0 A
		15							■	■	■	■	■	■	E 3 – 0 A
		30							■	■	■	■	■	■	E 4 – 0 A
1	FS5	10					■		■	■	■	■	■	■	H 2 – 0 A
		15					■		■	■	■	■	■	■	H 3 – 0 A
		30							■	■	■	■	■	■	H 4 – 0 A
5P	10	5					■		■	■	■	■	■	■	L 1 – 0 A
		10							■	■	■	■	■	■	L 2 – 0 A
		15								■	■	■	■	■	L 3 – 0 A
		30										■	■	■	L 4 – 0 A
10P	10	5					■		■	■	■	■	■	■	Q 1 – 0 A
		10							■	■	■	■	■	■	Q 2 – 0 A
		15							■	■	■	■	■	■	Q 3 – 0 A
		30										■	■	■	Q 4 – 0 A
0.5	FS5	5	5P	10	5				■	■	■	■	■	■	E 1 – 1 L
		10			10						■	■	■	■	E 2 – 2 L
		15			15							■	■	■	E 3 – 3 L
		30			30								■	■	E 4 – 4 L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E 1 – 1 Q
		10			10					■	■	■	■	■	E 2 – 2 Q
		15			15							■	■	■	E 3 – 3 Q
		30			30								■	■	E 4 – 4 Q
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H 1 – 1 L
		10			10					■	■	■	■	■	H 2 – 2 L
		10			15						■	■	■	■	H 2 – 3 L
		15			15						■	■	■	■	H 3 – 3 L
		15			30							■	■	■	H 3 – 4 L
		30			30								■	■	H 4 – 4 L
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H 1 – 1 Q
		10			10				■	■	■	■	■	■	H 2 – 2 Q
		10			15						■	■	■	■	H 2 – 3 Q
		15			15						■	■	■	■	H 3 – 3 Q
		15			30							■	■	■	H 3 – 4 Q
		30			30								■	■	H 4 – 4 Q

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 25 kA, I_{PN} = 2x 100 A)
Thermal strength 300 x I_{PN}
1st core class 10P; instrument security factor 10; rating 15 VA
2nd core without

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes
Order No.:	4	M	A	7	■	5	4	–	■	■	■	■	■	–	■	■	■	■	–	★
																	s. p. 40	s. p. 40		s. p. 40
													0							
													1							
													2							
													3							
													4							
													5							
													7							

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes
Order No.:	4	M	A	7	2	5	4	–	3	M										
													3							
													Q	3			–	0	A	

Example for Order No.: 4 M A 7 2 5 4 – 3 M Q 3 3 – 0 A

Order codes:

МИГ 23 ЕООД · MIG 23 LTD · СОФИЯ
ВЯРНО С ОРИГИНАЛА

000178

Equipment Selection

4MA7 indoor support-type current transformer, block-type design

31.5 kA

10th to 14th position

Core versions

At rated primary current I_{PN}	Thermal strength	Position 10 11 12
400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
250 A 300 A	150 x I_{PN}	1
200 A	200 x I_{PN}	2
125 A 150 A	300 x I_{PN}	3
100 A	400 x I_{PN}	4
75 A	500 x I_{PN}	5
60 A	600 x I_{PN}	6
50 A	800 x I_{PN}	7
40 A	1000 x I_{PN}	8

1st core			2nd core			Thermal strength										Position 10 11 12 13 14 15 16	Order codes
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}		s. p. 40 s. p. 40 s. p. 40	
0.2	FS10	10							■	■	■	■	■	■		C 2 – 0 A	
		15								■	■	■	■	■		C 3 – 0 A	
0.5	FS5	10					■	■	■	■	■	■	■	■		E 2 – 0 A	
		15						■	■	■	■	■	■	■		E 3 – 0 A	
		30								■	■	■	■	■		E 4 – 0 A	
1	FS5	10					■	■	■	■	■	■	■	■		H 2 – 0 A	
		15						■	■	■	■	■	■	■		H 3 – 0 A	
		30								■	■	■	■	■		H 4 – 0 A	
5P	10	5					■	■	■	■	■	■	■	■		L 1 – 0 A	
		10								■	■	■	■	■		L 2 – 0 A	
		15								■	■	■	■	■		L 3 – 0 A	
		30									■	■	■	■		L 4 – 0 A	
10P	10	5					■	■	■	■	■	■	■	■		Q 1 – 0 A	
		10					■	■	■	■	■	■	■	■		Q 2 – 0 A	
		15								■	■	■	■	■		Q 3 – 0 A	
		30									■	■	■	■		Q 4 – 0 A	
0.5	FS5	5	5P	10	5			■	■	■	■	■	■	■	■	E 1 – 1 L	
		10			10					■	■	■	■	■	■	E 2 – 2 L	
		15			15							■	■	■	■	E 3 – 3 L	
		30			30										■	E 4 – 4 L	
0.5	FS5	5	10P	10	5			■	■	■	■	■	■	■	■	E 1 – 1 Q	
		10			10					■	■	■	■	■	■	E 2 – 2 Q	
		15			15							■	■	■	■	E 3 – 3 Q	
		30			30										■	E 4 – 4 Q	
1	FS5	5	5P	10	5	■	■	■	■	■	■	■	■	■	■	H 1 – 1 L	
		10			10					■	■	■	■	■	■	H 2 – 2 L	
		10			15							■	■	■	■	H 2 – 3 L	
		15			15							■	■	■	■	H 3 – 3 L	
		15			30									■	■	H 3 – 4 L	
		30			30										■	H 4 – 4 L	
1	FS5	5	10P	10	5	■	■	■	■	■	■	■	■	■	■	H 1 – 1 Q	
		10			10					■	■	■	■	■	■	H 2 – 2 Q	
		10			15							■	■	■	■	H 2 – 3 Q	
		15			15							■	■	■	■	H 3 – 3 Q	
		15			30									■	■	H 3 – 4 Q	
		30			30										■	H 4 – 4 Q	

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 31.5 kA, I_{PN} = 100 A)
Thermal strength 400 x I_{PN}
1st core class 0.2; instrument security factor FS10; rating 15 VA
2nd core without

4 M A 7 2 5 7 – 0 M 4 C 3 – 0 A

Example for Order No.: 4 M A 7 2 5 7 – 0 M C 3 4 – 0 A ■ ■
Order codes:

31.5 kA – with primary multi-ratio

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength	Position 12
2x 300 A 2x 400 A 2x 500 A 2x 600 A	100 x I_{PN}	0
250 A 300 A	150 x I_{PN}	1
200 A	200 x I_{PN}	2
125 A 150 A	300 x I_{PN}	3
100 A	400 x I_{PN}	4
75 A	500 x I_{PN}	5
60 A	600 x I_{PN}	6
50 A	800 x I_{PN}	7
40 A	1000 x I_{PN}	8

1st core			2nd core			Thermal strength									Order codes					
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	Pos. 10	11	12	13	14	15
0.2	FS10	10						■	■	■	■	■	■	■	C	2	–	0	A	
		15							■	■	■	■	■	■	C	3	–	0	A	
0.5	FS5	10				■	■	■	■	■	■	■	■	■	E	2	–	0	A	
		15					■	■	■	■	■	■	■	■	E	3	–	0	A	
		30						■	■	■	■	■	■	■	E	4	–	0	A	
1	FS5	10				■	■	■	■	■	■	■	■	■	H	2	–	0	A	
		15				■	■	■	■	■	■	■	■	■	H	3	–	0	A	
		30						■	■	■	■	■	■	■	H	4	–	0	A	
5P	10	5				■	■	■	■	■	■	■	■	■	L	1	–	0	A	
		10						■	■	■	■	■	■	■	L	2	–	0	A	
		15							■	■	■	■	■	■	L	3	–	0	A	
		30								■	■	■	■	■	L	4	–	0	A	
10P	10	5				■	■	■	■	■	■	■	■	■	Q	1	–	0	A	
		10					■	■	■	■	■	■	■	■	Q	2	–	0	A	
		15						■	■	■	■	■	■	■	Q	3	–	0	A	
		30								■	■	■	■	■	Q	4	–	0	A	
0.5	FS5	5	5P	10	5		■	■	■	■	■	■	■	■	E	1	–	1	L	
		10			10					■	■	■	■	■	E	2	–	2	L	
		15			15							■	■	■	E	3	–	3	L	
		30			30							■	■	■	E	4	–	4	L	
0.5	FS5	5	10P	10	5			■	■	■	■	■	■	■	E	1	–	1	Q	
		10			10					■	■	■	■	■	E	2	–	2	Q	
		15			15							■	■	■	E	3	–	3	Q	
		30			30								■	■	E	4	–	4	Q	
1	FS5	5	5P	10	5	■	■	■	■	■	■	■	■	■	H	1	–	1	L	
		10			10				■	■	■	■	■	■	H	2	–	2	L	
		10			15						■	■	■	■	H	2	–	3	L	
		15			15						■	■	■	■	H	3	–	3	L	
		15			30								■	■	H	3	–	4	L	
		30			30								■	■	H	4	–	4	L	
1	FS5	5	10P	10	5	■	■	■	■	■	■	■	■	■	H	1	–	1	Q	
		10			10				■	■	■	■	■	■	H	2	–	2	Q	
		10			15						■	■	■	■	H	2	–	3	Q	
		15			15						■	■	■	■	H	3	–	3	Q	
		15			30								■	■	H	3	–	4	Q	
		30			30								■	■	H	4	–	4	Q	

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 31.5 kA, I_{PN} = 2x 100 A)
Thermal strength 400 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 5 VA
2nd core class 10P; accuracy limit factor 10; rating 5 VA

	Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes		
Example for Order No.:		4	M	A	7	2	5	7	–	3	M	E	1	4	–	1	Q	s. p. 40	s. p. 40	* s. p. 40			
Order codes:																							

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40 kA

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength	Order No. 10
400 A 500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
300 A	150 x I_{PN}	1
200 A 250 A	200 x I_{PN}	2
150 A	300 x I_{PN}	3
100 A 125 A	400 x I_{PN}	4
75 A	600 x I_{PN}	6
60 A	800 x I_{PN}	7
50 A	1000 x I_{PN}	8

1st core Class	1st core Factor	1st core VA rating	2nd core Class	2nd core Factor	2nd core VA rating	Thermal strength 1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	Order No. 11	12	13	14	15	16
0.2	FS10	10						■		■	■	■	■	■	C	2	–	0	A	
		15								■	■	■	■	■	C	3	–	0	A	
0.5	FS5	10				■	■	■		■	■	■	■	■	E	2	–	0	A	
		15				■	■	■		■	■	■	■	■	E	3	–	0	A	
		30								■	■	■	■	■	E	4	–	0	A	
1	FS5	10				■	■	■		■	■	■	■	■	H	2	–	0	A	
		15				■	■	■		■	■	■	■	■	H	3	–	0	A	
		30								■	■	■	■	■	H	4	–	0	A	
5P	10	5				■	■	■		■	■	■	■	■	L	1	–	0	A	
		10								■	■	■	■	■	L	2	–	0	A	
		15								■	■	■	■	■	L	3	–	0	A	
		30										■	■	■	L	4	–	0	A	
10P	10	5				■	■	■		■	■	■	■	■	Q	1	–	0	A	
		10					■	■		■	■	■	■	■	Q	2	–	0	A	
		15						■		■	■	■	■	■	Q	3	–	0	A	
		30									■	■	■	■	Q	4	–	0	A	
0.5	FS5	5	5P	10	5	■	■	■		■	■	■	■	■	E	1	–	1	L	
		10			10					■	■	■	■	■	E	2	–	2	L	
		15			15						■	■	■	■	E	3	–	3	L	
		30			30									■	E	4	–	4	L	
0.5	FS5	5	10P	10	5	■	■	■		■	■	■	■	■	E	1	–	1	Q	
		10			10					■	■	■	■	■	E	2	–	2	Q	
		15			15						■	■	■	■	E	3	–	3	Q	
		30			30									■	E	4	–	4	Q	
1	FS5	5	5P	10	5	■	■	■		■	■	■	■	■	H	1	–	1	L	
		10			10					■	■	■	■	■	H	2	–	2	L	
		10			15						■	■	■	■	H	2	–	3	L	
		15			15						■	■	■	■	H	3	–	3	L	
		15			30								■	■	H	3	–	4	L	
		30			30									■	H	4	–	4	L	
1	FS5	5	10P	10	5	■	■	■		■	■	■	■	■	H	1	–	1	Q	
		10			10					■	■	■	■	■	H	2	–	2	Q	
		10			15						■	■	■	■	H	2	–	3	Q	
		15			15						■	■	■	■	H	3	–	3	Q	
		15			30								■	■	H	3	–	4	Q	
		30			30									■	H	4	–	4	Q	

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 40 kA, I_{PN} = 100 A)
Thermal strength 400 x I_{PN}
1st core class 1; instrument security factor FS5; rating 5 VA
2nd core class 5P; accuracy limit factor 10; rating 5 VA

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes
Order No.:	4	M	A	7	■	6	3	–	■	■	■	■	■	–	■	■	■	■	–	■ ■ ■
																	s. p. 40	s. p. 40	s. p. 40	
Example for Order No.:	4	M	A	7	2	6	3	–	0	M	E	1	4	–	1	L	■	■		
Order codes:																				

40 kA – with primary multi-ratio

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength
2x 400 A 2x 500 2x 600 A	100 x I_{PN}
2x 300 A	150 x I_{PN}
2x 200 A 2x 250 A	200 x I_{PN}
2x 150 A	300 x I_{PN}
2x 100 A 2x 125 A	400 x I_{PN}
2x 75 A	600 x I_{PN}
2x 60 A	800 x I_{PN}
2x 50 A	1000 x I_{PN}

1st core			2nd core			Thermal strength								
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}
0.2	FS10	10						■		■	■	■	■	■
		15								■	■	■	■	■
0.5	FS5	10						■		■	■	■	■	■
		15					■	■		■	■	■	■	■
		30						■		■	■	■	■	■
1	FS5	10						■		■	■	■	■	■
		15					■	■		■	■	■	■	■
		30						■		■	■	■	■	■
5P	10	5					■	■		■	■	■	■	■
		10						■		■	■	■	■	■
		15								■	■	■	■	■
		30									■	■	■	■
10P	10	5					■	■		■	■	■	■	■
		10						■		■	■	■	■	■
		15						■		■	■	■	■	■
		30									■	■	■	■
0.5	FS5	5	5P	10	5			■	■	■	■	■	■	■
		10			10						■	■	■	■
		15			15							■	■	■
		30			30								■	■
0.5	FS5	5	10P	10	5			■	■	■	■	■	■	■
		10			10					■	■	■	■	■
		15			15							■	■	■
		30			30								■	■
1	FS5	5	5P	10	5	■	■	■		■	■	■	■	■
		10			10					■	■	■	■	■
		10			15						■	■	■	■
		15			15						■	■	■	■
		15			30								■	■
		30			30								■	■
1	FS5	5	10P	10	5	■	■	■		■	■	■	■	■
		10			10					■	■	■	■	■
		10			15						■	■	■	■
		15			15						■	■	■	■
		15			30								■	■
		30			30								■	■

■ Feasible (other combinations on request)

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 40 kA, I_{PN} = 2x 100 A)
Thermal strength 400 x I_{PN}
1st core class 0.2; instrument security factor FS10; rating 10 VA
2nd core without

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes
Order No.:	4	M	A	7	■	6	3	–	■	■	■	■	■	–	■	■	■ s. p. 40	■ s. p. 40	–	★ s. p. 40	■ ■ ■
													0							
													1							
													2							
													3							
													4							
													6							
													7							
													8							
											C	2		–	0	A				
											C	3		–	0	A				
											E	2		–	0	A				
											E	3		–	0	A				
											E	4		–	0	A				
											H	2		–	0	A				
											H	3		–	0	A				
											H	4		–	0	A				
											L	1		–	0	A				
											L	2		–	0	A				
											L	3		–	0	A				
											L	4		–	0	A				
											Q	1		–	0	A				
											Q	2		–	0	A				
											Q	3		–	0	A				
											Q	4		–	0	A				
											E	1		–	1	L				
											E	2		–	2	L				
											E	3		–	3	L				
											E	4		–	4	L				
											E	1		–	1	Q				
											E	2		–	2	Q				
											E	3		–	3	Q				
											E	4		–	4	Q				
											H	1		–	1	L				
											H	2		–	2	L				
											H	2		–	3	L				
											H	3		–	3	L				
											H	3		–	4	L				
											H	4		–	4	L				
											H	1		–	1	Q				
											H	2		–	2	Q				
											H	2		–	3	Q				
											H	3		–	3	Q				
											H	3		–	4	Q				
											H	4		–	4	Q				

Example for Order No.:	4	M	A	7	2	6	3	–	3	M	C	2	4	–	0	A	■	■	■	■
Order codes:																				

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Equipment Selection

4MA7 indoor support-type current transformer, block-type design

50 kA

10th to 14th position

Core versions

At rated primary current I_{PN}	Thermal strength	Position 12
500 A 600 A 750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
400 A	150 x I_{PN}	1
250 A 300 A	200 x I_{PN}	2
200 A	300 x I_{PN}	3
125 A 150 A	400 x I_{PN}	4
100 A	500 x I_{PN}	5
75 A	800 x I_{PN}	7
60 A	1000 x I_{PN}	8

1st core			2nd core			Thermal strength								Position 10	Position 11	Position 13	Position 14
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}				
0.2	FS10	10							■	■	■	■	■	■	C	2	–	0 A
		15								■	■	■	■	■	C	3	–	0 A
0.5	FS5	10				■	■		■	■	■	■	■	■	E	2	–	0 A
		15					■		■	■	■	■	■	■	E	3	–	0 A
		30							■	■	■	■	■	■	E	4	–	0 A
1	FS5	10				■	■		■	■	■	■	■	■	H	2	–	0 A
		15				■	■		■	■	■	■	■	■	H	3	–	0 A
		30							■	■	■	■	■	■	H	4	–	0 A
5P	10	5				■	■		■	■	■	■	■	■	L	1	–	0 A
		10							■	■	■	■	■	■	L	2	–	0 A
		15								■	■	■	■	■	L	3	–	0 A
		30									■	■	■	■	L	4	–	0 A
10P	10	5				■	■		■	■	■	■	■	■	Q	1	–	0 A
		10					■		■	■	■	■	■	■	Q	2	–	0 A
		15							■	■	■	■	■	■	Q	3	–	0 A
		30									■	■	■	■	Q	4	–	0 A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E	1	–	1 L
		10			10					■	■	■	■	■	E	2	–	2 L
		15			15							■	■	■	E	3	–	3 L
		30			30									■	E	4	–	4 L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E	1	–	1 Q
		10			10					■	■	■	■	■	E	2	–	2 Q
		15			15							■	■	■	E	3	–	3 Q
		30			30									■	E	4	–	4 Q
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H	1	–	1 L
		10			10					■	■	■	■	■	H	2	–	2 L
		10			15						■	■	■	■	H	2	–	3 L
		15			15						■	■	■	■	H	3	–	3 L
		15			30								■	■	H	3	–	4 L
		30			30									■	H	4	–	4 L
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H	1	–	1 Q
		10			10				■	■	■	■	■	■	H	2	–	2 Q
		10			15						■	■	■	■	H	2	–	3 Q
		15			15						■	■	■	■	H	3	–	3 Q
		15			30								■	■	H	3	–	4 Q
		30			30									■	H	4	–	4 Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 50 kA, I_{PN} = 100 A)
Thermal strength **500 x I_{PN}**
1st core class **0.5**; instrument security factor **FS5**; rating **5 VA**
2nd core class **5P**; accuracy limit factor **10**; rating **5 VA**

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes
Order No.:	4	M	A	7	■	6	7	–	■	■	■	■	■	–	■	■	■	■	–	■ ■ ■
																	s. p. 40	s. p. 40	s. p. 40	
Example for Order No.:	4	M	A	7	2	6	7	–	0	M	E	1	5	–	1	L	■	■		
Order codes:																				

50 kA – with primary multi-ratio

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength	Position: 10 11 12	Order No.:
2x 500 A 2x 600 A	100 x I_{PN}	0	
2x 400 A	150 x I_{PN}	1	
2x 250 A 2x 300 A	200 x I_{PN}	2	
2x 200 A	300 x I_{PN}	3	
2x 125 A 2x 150 A	400 x I_{PN}	4	
2x 100 A	500 x I_{PN}	5	
2x 75 A	800 x I_{PN}	7	
2x 50 A 2x 60 A	1000 x I_{PN}	8	

1st core			2nd core			Thermal strength								
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}
0.2	FS10	10							■	■	■	■	■	■
		15								■	■	■	■	■
0.5	FS5	10				■	■		■	■	■	■	■	■
		15					■		■	■	■	■	■	■
		30							■	■	■	■	■	■
1	FS5	10				■	■		■	■	■	■	■	■
		15				■	■		■	■	■	■	■	■
		30							■	■	■	■	■	■
5P	10	5				■	■		■	■	■	■	■	■
		10							■	■	■	■	■	■
		15								■	■	■	■	■
		30										■	■	■
10P	10	5				■	■		■	■	■	■	■	■
		10							■	■	■	■	■	■
		15								■	■	■	■	■
		30										■	■	■
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■
		10			10					■	■	■	■	■
		15			15								■	■
		30			30								■	■
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■
		10			10					■	■	■	■	■
		15			15							■	■	■
		30			30								■	■
1	FS5	5	5P	10	5		■		■	■	■	■	■	■
		10			10					■	■	■	■	■
		10			15							■	■	■
		15			15							■	■	■
		15			30								■	■
		30			30								■	■
1	FS5	5	10P	10	5		■		■	■	■	■	■	■
		10			10				■	■	■	■	■	■
		10			15						■	■	■	■
		15			15						■	■	■	■
		15			30							■	■	■
		30			30							■	■	■

■ Feasible (other combinations on request)

Position: 13 14 15 16				Order codes
–	0	A		
–	0	A		
–	0	A		
–	0	A		
–	0	A		
–	0	A		
–	0	A		
–	0	A		
–	0	A		
–	0	A		
–	0	A		
–	0	A		
–	0	A		
–	0	A		
–	0	A		
–	0	A		
–	1	L		
–	2	L		
–	3	L		
–	4	L		
–	1	Q		
–	2	Q		
–	3	Q		
–	4	Q		
–	1	L		
–	2	L		
–	3	L		
–	3	L		
–	4	L		
–	4	L		
–	1	Q		
–	2	Q		
–	3	Q		
–	3	Q		
–	4	Q		
–	4	Q		

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 50 kA, I_{PN} = 2x 100 A)
Thermal strength 500 x I_{PN}
1st core class **0.5**; instrument security factor **FS5**; rating 5 VA
2nd core class **5P**; accuracy limit factor **10**; rating 5 VA

Example for Order No.: 4 M A 7 2 6 7 – 3 M E 1 5 – 1 L ■ ■
Order codes:

ВЯРНО С ОРИГИНАЛА
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Equipment Selection

4MA7 indoor support-type current transformer, block-type design

2

63 kA

10th to 14th position
Core versions

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 – Order codes

Order No.: 4 M A 7 ■ 7 1 – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

(15: s. p. 40; 16: s. p. 40; ★: s. p. 40)

At rated primary current I_{PN}	Thermal strength	Position 12
750 A 1000 A 1200 A 1250 A 1500 A 2000 A 2500 A	100 x I_{PN}	0
500 A 600 A	150 x I_{PN}	1
400 A	200 x I_{PN}	2
250 A 300 A	300 x I_{PN}	3
200 A	400 x I_{PN}	4
125 A 150 A	500 x I_{PN}	5
100 A	800 x I_{PN}	7
75 A	1000 x I_{PN}	8

1st core Class	1st core Factor	1st core VA rating	2nd core Class	2nd core Factor	2nd core VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}	Pos. 10	Pos. 11	–	Pos. 13	Pos. 14
0.2	FS10	10							■	■	■	■	■	■	C	2	–	0	A
		15								■	■	■	■	■	C	3	–	0	A
0.5	FS5	10				■	■		■	■	■	■	■	■	E	2	–	0	A
		15					■		■	■	■	■	■	■	E	3	–	0	A
		30							■	■	■	■	■	■	E	4	–	0	A
1	FS5	10				■	■		■	■	■	■	■	■	H	2	–	0	A
		15				■	■		■	■	■	■	■	■	H	3	–	0	A
		30							■	■	■	■	■	■	H	4	–	0	A
5P	10	5				■	■		■	■	■	■	■	■	L	1	–	0	A
		10							■	■	■	■	■	■	L	2	–	0	A
		15								■	■	■	■	■	L	3	–	0	A
		30										■	■	■	L	4	–	0	A
10P	10	5				■	■		■	■	■	■	■	■	Q	1	–	0	A
		10					■		■	■	■	■	■	■	Q	2	–	0	A
		15							■	■	■	■	■	■	Q	3	–	0	A
		30									■	■	■	■	Q	4	–	0	A
0.5	FS5	5	5P	10	5		■		■	■	■	■	■	■	E	1	–	1	L
		10			10					■	■	■	■	■	E	2	–	2	L
		15			15							■	■	■	E	3	–	3	L
		30			30									■	E	4	–	4	L
0.5	FS5	5	10P	10	5		■		■	■	■	■	■	■	E	1	–	1	Q
		10			10					■	■	■	■	■	E	2	–	2	Q
		15			15							■	■	■	E	3	–	3	Q
		30			30									■	E	4	–	4	Q
1	FS5	5	5P	10	5		■		■	■	■	■	■	■	H	1	–	1	L
		10			10					■	■	■	■	■	H	2	–	2	L
		10			15					■	■	■	■	■	H	2	–	3	L
		15			15						■	■	■	■	H	3	–	3	L
		15			30								■	■	H	3	–	4	L
		30			30									■	H	4	–	4	L
1	FS5	5	10P	10	5		■		■	■	■	■	■	■	H	1	–	1	Q
		10			10				■	■	■	■	■	■	H	2	–	2	Q
		10			15					■	■	■	■	■	H	2	–	3	Q
		15			15						■	■	■	■	H	3	–	3	Q
		15			30							■	■	■	H	3	–	4	Q
		30			30								■	■	H	4	–	4	Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, block-type design (U_m = 12 kV, I_{th} = 63 kA, I_{PN} = 100 A) — 4 M A 7 … 2 7 1 – 0 M

Thermal strength 800 x I_{PN} — 7

1st core class 0.5; instrument security factor FS5; rating 15 VA
2nd core without — E 3 – 0 A

Example for Order No.: 4 M A 7 2 7 1 – 0 M E 3 7 – 0 A ■ ■

Order codes:

63 kA – with primary multi-ratio

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength
2x 500 A 2x 600 A	150 x I_{PN}
2x 400 A	200 x I_{PN}
2x 250 A 2x 300 A	300 x I_{PN}
2x 200 A	400 x I_{PN}
2x 125 A 2x 150 A	500 x I_{PN}
2x 100 A	800 x I_{PN}
2x 75 A	1000 x I_{PN}

1st core			2nd core			Thermal strength								
Class	Factor	VA rating	Class	Factor	VA rating	1000 x I_{PN}	800 x I_{PN}	600 x I_{PN}	500 x I_{PN}	400 x I_{PN}	300 x I_{PN}	200 x I_{PN}	150 x I_{PN}	100 x I_{PN}
0.2	FS10	10							■	■	■	■	■	
		15								■	■	■	■	
0.5	FS5	10					■	■	■	■	■	■	■	
		15						■	■	■	■	■	■	
		30							■	■	■	■	■	
1	FS5	10					■	■	■	■	■	■	■	
		15					■	■	■	■	■	■	■	
		30								■	■	■	■	
5P	10	5					■	■	■	■	■	■	■	
		10							■	■	■	■	■	
		15							□	■	■	■	■	
		30										■	■	
10P	10	5					■	■	■	■	■	■	■	
		10						■	■	■	■	■	■	
		15							■	■	■	■	■	
		30									■	■	■	
0.5	FS5	5	5P	10	5			■	■	■	■	■	■	
		10			10					■	■	■	■	
		15			15							■	■	
		30			30									■
0.5	FS5	5	10P	10	5			■	■	■	■	■	■	
		10			10					■	■	■	■	
		15			15							■	■	
		30			30									■
1	FS5	5	5P	10	5			■	■	■	■	■	■	
		10			10					■	■	■	■	
		10			15					■	■	■	■	
		15			15							■	■	
		15			30									■
		30			30									■
1	FS5	5	10P	10	5			■	■	■	■	■	■	
		10			10					■	■	■	■	
		10			15					■	■	■	■	
		15			15							■	■	
		15			30									■
		30			30									■

■ Feasible (other combinations on request) □ Not for 2x 125 A

Configuration example
Indoor support-type current transformer, block-type design
(U_m = 12 kV, I_{th} = 63 kA, I_{PN} = 2x 100 A)
Thermal strength 800 x I_{PN}
1st core class 0.5; instrument security factor FS5; rating 5 VA
2nd core class 10P; accuracy limit factor 10; rating 5 VA

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes

Order No.: 4 M A 7 ■ 7 1 – ■ ■ ■ ■ ■ – ■ ■ s. p. 40 s. p. 40 – s. p. 40 ★ ■ ■ ■

10	11	12	13	14
		1		
		2		
		3		
		4		
		5		
		7		
		8		
C	2		–	0 A
C	3		–	0 A
E	2		–	0 A
E	3		–	0 A
E	4		–	0 A
H	2		–	0 A
H	3		–	0 A
H	4		–	0 A
L	1		–	0 A
L	2		–	0 A
L	3		–	0 A
L	4		–	0 A
Q	1		–	0 A
Q	2		–	0 A
Q	3		–	0 A
Q	4		–	0 A
E	1		–	1 L
E	2		–	2 L
E	3		–	3 L
E	4		–	4 L
E	1		–	1 Q
E	2		–	2 Q
E	3		–	3 Q
E	4		–	4 Q
H	1		–	1 L
H	2		–	2 L
H	2		–	3 L
H	3		–	3 L
H	3		–	4 L
H	4		–	4 L
H	1		–	1 Q
H	2		–	2 Q
H	2		–	3 Q
H	3		–	3 Q
H	3		–	4 Q
H	4		–	4 Q

4 M A 7 2 7 1 – 3 M E 1 7 – 1 Q

Example for Order No.: 4 M A 7 2 7 1 – 3 M E 1 7 – 1 Q ■ ■

Order codes:

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ВЯРНО С ОРИГИНАЛА

000182

Equipment Selection

4MA7 indoor support-type current transformer, block-type design

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes

Order No.: 4 M A 7 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – + ■ ■ ■

15th position
Rated secondary current

Rated current for 1st core	Rated current for 2nd core	
1 A	Without 2nd core	0 A A
5 A	Without 2nd core	0 A B
1 A	1 A	C
5 A	5 A	D
1 A	5 A	E
5 A	1 A	F

16th position
Additional features

Options	
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval 1)	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

1) Only for class 0.2 and 0.5

Special versions

Options		
With routine test certificate in German/English		– Z A 1 0
With capacitive layer for voltage detecting system	6 kV	– Z C 0 6
	10 kV	– Z C 1 0
	15 kV	– Z C 1 5
Differential earth-fault balance in protection core		– Z D 1 0
Other special versions on request		

Configuration example

Indoor support-type current transformer, block-type design — 4 M A 7

Maximum operating voltage U_m = 12 kV — 2

Rated lightning impulse withstand voltage U_p = 75 kV — 7 1 –

Rated short-duration power-frequency withstand voltage U_d = 28 kV — 3 M

Rated short-time thermal current I_{th} = 63 kA — 7

Rated primary current I_{PN} = 2x 100 A — E 1 – 1 Q

Thermal strength 800 x I_{PN} — E

1st core class 0.5; instrument security factor FS5; rating 5 VA — 1

2nd core class 10P; accuracy limit factor 10; rating 5 VA — – Z A 1 0

Rated secondary current 1st core 1A; 2nd core 5A — – Z C 1 0

Power frequency 50 Hz; marking according to IEC

With routine test certificate in German/English

With capacitive layer for voltage detecting system 10 kV

Example for Order No.: 4 M A 7 2 7 1 – 3 M E 1 7 – 1 Q E 1 – Z

Order codes: A 1 0 + C 1 0

4MB1 indoor support-type current transformer, single-turn design

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16	–		Order codes
Order No.:	4	M	B	1	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■ ■ ■
											See page 42	See page 42	See page 42		See page 42	See page 42	See page 43	See page 43		See page 43	

5th position
Operating voltage (maximum value)

Operating voltage U_m kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Order No.
12	75	28	4 M B 1 2
17.5	95	38	4 M B 1 3
24	128	50	4 M B 1 4

6th/7th position
Rated short-time thermal current

Rated short-time thermal current I_{th} kA	6	7
150	7	8
200	8	2
250	8	4
300	8	5
500	8	8

8th/9th position
Rated primary current

Rated primary current I_N A	Remark	Rated short-time thermal current 150 kA	200 kA	250 kA	300 kA	500 kA	8	9
1500		■					1	D
2000			■				1	F
2500				■			1	G
3000					■		1	H
4000						■	1	J
5000	Only 4MB13					■	1	K
6000	Only 4MB13					■	1	L

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, single-turn design	4 M B 1
Maximum operating voltage U_m = 24 kV	
Rated lightning impulse withstand voltage U_p = 125 kV	
Rated short-duration power-frequency withstand voltage U_d = 50 kV	4
Rated short-time thermal current I_{th} = 300 kA	8 5 –
Rated primary current I_{PN} = 3000 A	1 H
Example for Order No.:	4 M B 1 4 8 5 – 1 H ■ ■ ■ – ■ ■ ■ ■
Order codes:	

2

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000183

Equipment Selection

4MB1 indoor support-type current transformer, single-turn design

10th to 14th position
Core versions

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes		
Order No.:	4	M	B	1	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■

Positions 15, 16 and ★: See page 43

At rated primary current I_{PN}	Thermal strength	Order code (pos. 12)
1500 A 2000 A 2500 A 3000 A 4000 A 5000 A 6000 A	100 x I_{PN}	0

1st core Class	1st core Factor	1st core VA rating	2nd core Class	2nd core Factor	2nd core VA rating	1500 A	2000 A	2500 A	3000 A	4000 A	5000 A	6000 A	Order code (pos. 10, 11, 13, 14)
0.2	FS10	15				■	■	■	■	■	■	■	C 3 – 0 A
		30				■	■	■	■	■	■	■	C 4 – 0 A
0.5	FS10	15				■	■	■	■	■	■	■	F 3 – 0 A
		30				■	■	■	■	■	■	■	F 4 – 0 A
		60				■	■	■	■	■	■	■	F 6 – 0 A
1	FS10	15				■	■	■	■	■	■	■	J 3 – 0 A
		30				■	■	■	■	■	■	■	J 4 – 0 A
		60				■	■	■	■	■	■	■	J 6 – 0 A
5P	10	30				■	■	■	■	■	■	■	L 4 – 0 A
		60				■	■	■	■	■	■	■	L 6 – 0 A
10P	10	30				■	■	■	■	■	■	■	Q 4 – 0 A
		60				■	■	■	■	■	■	■	Q 6 – 0 A
0.5	FS10	15	5P	10	15	■	■	■	■	■	■	■	F 3 – 3 L
		30			30	■	■	■	■	■	■	■	F 4 – 4 L
		30			60						■	■	F 6 – 6 L
1	FS10	15	5P	10	15	■	■	■	■	■	■	■	J 3 – 3 L
		30			30	■	■	■	■	■	■	■	J 4 – 4 L
		60			60						■	■	J 6 – 6 L
0.5	FS10	15	10P	10	15	■	■	■	■	■	■	■	F 3 – 3 Q
		30			30	■	■	■	■	■	■	■	F 4 – 4 Q
		60			60						■	■	F 6 – 6 Q
1	FS10	15	10P	10	15	■	■	■	■	■	■	■	J 3 – 3 Q
		30			30	■	■	■	■	■	■	■	J 4 – 4 Q
		60			60						■	■	J 6 – 6 Q

■ Feasible (other combinations on request)

Configuration example

Indoor support-type current transformer, single-turn design	4 M B 1
(U_m = 24 kV, I_{th} = 300 kA, I_{PN} = 3000 A)	4 8 5 – 1 H
Thermal strength 100 x I_{PN}	0
1st core class 0.5; instrument security factor FS10; rating 30 VA 2nd core class 5P; accuracy limit factor 10; rating 30 VA	F 4 – 4 L

Example for Order No.: 4 M B 1 4 8 5 – 1 H F 4 0 – 4 L ■ ■

Order codes:

2

Equipment Selection

4MB1 indoor support-type current transformer, single-turn design

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes

Order No.: 4 M B 1 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

15th position
Rated secondary current

Rated current for 1st core	Rated current for 2nd core	
1 A	Without 2nd core	0 A A
5 A	Without 2nd core	0 A B
1 A	1 A	C
5 A	5 A	D
1 A	5 A	E
5 A	1 A	F

16th position
Additional features

Options	
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval [1]	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

1) Only for class 0.2 and 0.5

Special versions

Options	
With routine test certificate in German/English	– Z A 1 0
Other special versions on request	

Configuration example

Indoor support-type current transformer, single-turn design
Maximum operating voltage U_m = 24 kV
Rated lightning impulse withstand voltage U_p = 125 kV
Rated short-duration power-frequency withstand voltage U_d = 50 kV
Rated short-time thermal current I_{th} = 300 kA
Rated primary current I_{PN} = 3000 A
Thermal strength 100 x I_{PN}
1st core class 0.5; instrument security factor FS10; rating 30 VA
2nd core class 5P; accuracy limit factor 10; rating 30 VA
Rated secondary current 1st core 5 A; 2nd core 5 A
Power frequency 60 Hz; marking according to IEC

Example for Order No.: 4 M B 1 4 8 5 – 1 H 3 0 F 4 – 4 L A 1 6

Order codes:

ВЯРНО С ОРИГИНАЛА
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000184

4MC2 indoor bushing-type current transformer, single-turn design

5th position
Operating voltage (maximum value)

Operating voltage U_m kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes
			Order No.:	4	M	C	2	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	+	■	■
														See page 45	See page 45	See page 45		See page 45	See page 45	See page 46	See page 46		See page 46	
12	75	28		4	M	C	2	2																
24	125	50		4	M	C	2	4																
36	170	70		4	M	C	2	6																

6th to 9th position
Rated short-time thermal current/ Rated primary current

Rated short-time thermal current I_{th} kA	Rated primary current I_{PN} A											
15	150					4	3	–	0	P		
20	200					4	8	–	0	Q		
30	300					5	6	–	0	S		
40	400					6	3	–	0	T		
50	500					6	7	–	0	U		
60	600					7	0	–	0	V		
80	800					7	3	–	0	X		
100	1000					7	5	–	1	A		
120	1200					7	6	–	1	B		
150	1500					7	8	–	1	D		
200	2000					8	2	–	1	F		
250	2500					8	4	–	1	G		
300	3000					8	5	–	1	H		

Configuration example
Indoor bushing-type current transformer, single-turn design
Maximum operating voltage U_m = 36 kV
Rated lightning impulse withstand voltage U_p = 170 kV
Rated short-duration power-frequency withstand voltage U_d = 70 kV
Rated short-time thermal current I_{th} = 50 kA
Rated primary current I_{PN} = 500 A

Example for Order No.:	4	M	C	2	6	6	7	–	0	U	■	■	■	–	■	■	■	■						
Order codes:																								

Equipment Selection

4MC2 indoor bushing-type current transformer, single-turn design

10th to 14th position
Core versions

At rated primary current I_{PN}	Thermal strength
150 A 200 A 300 A 400 A 500 A 600 A 800 A 1000 A 1200 A 1500 A 2000 A 2500 A 3000 A	100 x I_{PN}

1st core			2nd core			Rated primary current I_{PN}				
Class	Factor	VA rating	Class	Factor	VA rating	150 A	200 A	300–600 A	800–1500 A	2000–3000 A
0.2	FS10	10				■	■	■	■	■
		15				■	■	■	■	■
0.5	FS5	15				■	■	■	■	
		30				■	■	■	■	■
0.5	FS10	15								■
1	FS5	15				■	■	■	■	
		30				■	■	■	■	■
1	FS10	15								■
10P	10	15				■	■	■	■	■
		30				■	■	■	■	■
		60				■	■	■	■	■
0.2	FS10	10	10P	10	30	■	■	■	■	■
		15			30	■	■	■	■	■
0.5	FS5	15	10P	10	15	■	■	■	■	
		15			30	■	■	■	■	
		30			30	■	■	■	■	■
		30			60		■	■	■	■
0.5	FS10	15	10P	10	15					■
		15			30					■
1	FS5	15	10P	10	15	■	■	■	■	
		15			30	■	■	■	■	
		30			30	■	■	■	■	■
		30			60		■	■	■	■
1	FS10	15	10P	10	15					■
		15			30					■

■ Feasible (other combinations on request)

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes		
Order No.:	4	M	C	2	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■

See page 46 See page 46 See page 46

10	11	12		13	14	15	16
		0					
C	2		–	0	A		
C	3		–	0	A		
E	3		–	0	A		
E	4		–	0	A		
F	3		–	0	A		
H	3		–	0	A		
H	4		–	0	A		
J	3		–	0	A		
Q	3		–	0	A		
Q	4		–	0	A		
Q	6		–	0	A		
C	2		–	4	Q		
C	3		–	4	Q		
E	3		–	3	Q		
E	3		–	4	Q		
E	4		–	4	Q		
E	4		–	6	Q		
F	3		–	3	Q		
F	3		–	4	Q		
H	3		–	3	Q		
H	3		–	4	Q		
H	4		–	4	Q		
H	4		–	6	Q		
J	3		–	3	Q		
J	3		–	4	Q		

Configuration example
Indoor bushing-type current transformer, single-turn design
(U_m = 36 kV, I_{th} = 50 kA, I_{PN} = 500 A)
Thermal strength 100 x I_{PN}
1st core class 1; instrument security factor FS5; rating 30 VA
2nd core class 10P; accuracy limit factor 10; rating 30 VA

	4	M	C	2																		
					6	6	7	–	0	U												
													0									
											H	4		–	4	Q						
Example for Order No.:	4	M	C	2	6	6	7	–	0	U	H	4	0	–	4	Q	■	■	■	■	■	■
Order codes:																						

ВЯРНО С ОРИГИНАЛА
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000185

Equipment Selection

4MC2 indoor bushing-type current transformer, single-turn design

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes

Order No.: 4 M C 2 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

15th position
Rated secondary current

Rated current for 1st core	Rated current for 2nd core	
1 A	Without 2nd core	0 A A
5 A	Without 2nd core	0 A B
1 A	1 A	C
5 A	5 A	D
1 A	5 A	E
5 A	1 A	F

16th position
Additional features

Options	
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval 1)	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

1) Only for class 0.2 and 0.5

Special versions

Options	
With routine test certificate in German/English	– Z A 1 0
Other special versions on request	

Configuration example

Indoor bushing-type current transformer, single-turn design	4 M C 2
Maximum operating voltage U_m = 36 kV	
Rated lightning impulse withstand voltage U_p = 170 kV	6
Rated short-duration power-frequency withstand voltage U_d = 70 kV	6 7 –
Rated short-time thermal current I_{th} = 50 kA	0 U
Rated primary current I_{PN} = 500 A	0
Thermal strength 100 x I_{PN}	
1st core class 1; instrument security factor FS5; rating 30 VA	H 4
2nd core class 10P; accuracy limit factor 10; rating 30 VA	– 4 Q
Rated secondary current 1st core 5 A; 2nd core 1 A	F
Power frequency 50 Hz; marking according to VDE	0
Example for Order No.:	4 M C 2 6 6 7 – 0 U H 4 0 – 4 Q F 0
Order codes:	

4MC3 indoor bar-primary bushing-type current transformer

5th position
Operating voltage (maximum value)

Operating voltage U_m kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 – ★ Order codes Order No.:
12	75	28	4 M C 3 2 ■ ■ ■ – ■ ■ ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■ See page 48
24	125	50	4 M C 3 4 ■ ■ ■ – ■ ■ ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■ See page 48
36	170	70	4 M C 3 6 ■ ■ ■ – ■ ■ ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■ See page 48

6th to 9th position
Rated short-time thermal current/
Rated primary current

Rated short-time thermal current I_{th} kA	Rated primary current I_{PN} A	
200	2000	8 2 – 1 F
250	2500	8 4 – 1 G
300	3000	8 5 – 1 H
400	4000	8 7 – 1 J
500	5000	8 8 – 1 K
600	6000	7 0 – 1 L
800	8000	7 2 – 1 N
1000	10000	7 3 – 1 P

Configuration example
Indoor bar-primary bushing-type current transformer
Maximum operating voltage U_m = 12 kV
Rated lightning impulse withstand voltage U_p = 75 kV
Rated short-duration power-frequency withstand voltage U_d = 28 kV
Rated short-time thermal current I_{th} = 400 kA
Rated primary current I_{PN} = 4000 A

Example for Order No.: 4 M C 3 2 8 7 – 1 J ■ ■ ■
Order codes:

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000186

Equipment Selection

4MC3 indoor bar-primary bushing-type current transformer

10th to 14th position
Core versions

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 — Order codes

Order No.: 4 M C 3 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ — ■ ■ ■

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At rated primary current I_{PN}					Thermal strength
2000 A	2500 A	3000 A	4000 A	5000 A	
6000 A	8000 A	10000 A			100 x I_{PN}

1st core			2nd core			3rd core			4th core			Rated primary current I_{PN}				
Class	Factor	VA rating	Class	Factor	VA rating	Class	Factor	VA rating	Class	Factor	VA rating	2000–3000 A	4000–6000 A	8000–10000 A		
0.2	FS10	15										■	■	■	C	3 – 0 A
		30										■	■	■	C	4 – 0 A
0.5	FS10	15										■	■	■	F	3 – 0 A
		30										■	■	■	F	4 – 0 A
1	FS10	30										■	■	■	J	4 – 0 A
		60										■	■	■	J	6 – 0 A
10P	10	30										■	■	■	Q	4 – 0 A
		60										■	■	■	Q	6 – 0 A
10P	20	60										■	■	■	S	6 – 0 A
		100										■	■	■	S	8 – 0 A
0.5	FS10	15	10P	10	30							■	■	■	F	3 – 4 Q
		15			60							■	■	■	F	3 – 6 Q
		15	10P	20	60							■	■	■	F	3 – 6 S
		30			60							■	■	■	F	4 – 6 S
1	FS10	60	10P	20	100							■	■	■	J	6 – 8 S
10P	10	60										■	■	■	Q	6 – 8 S
10P	20	60										■	■	■	S	6 – 8 S
		100										■	■	■	S	8 – 8 S
0.5	FS10	15	10P	10	30	10P	10	60				■	■	■	Y	0 – 0 A
1	FS10	30	10P	20	60	10P	20	100				■	■	■	Y	0 – 0 B
0.2	FS10	15	0.2	FS10	30	10P	10	30				■	■	■	Y	0 – 0 C
0.5	FS10	15			30			30				■	■	■	Y	0 – 0 D
0.2	FS10	30	1	FS10	60	10P	10	60	10P	20	100	■	■	■	Y	0 – 1 A
0.5	FS10	30			60			60			100	■	■	■	Y	0 – 1 B
1	FS10	30			60			60			100	■	■	■	Y	0 – 1 C
0.2	FS10	30	1	FS10	60	10P	10	60	10P	20	100	■	■	■	Y	0 – 1 D
0.5	FS10	30			60			60			100	■	■	■	Y	0 – 1 E
1	FS10	30			60			60			100	■	■	■	Y	0 – 1 F

■ Feasible (other combinations on request)

Configuration example

Indoor bar-primary bushing-type current transformer
(U_m = 12 kV, I_{th} = 400 kA, I_{PN} = 4000 A)
Thermal strength 100 x I_{PN}
1st core class 0.5; instrument security factor FS10; rating 15 VA
2nd core class 0.2; instrument security factor FS10; rating 30 VA
3rd core class 10P; accuracy limit factor 10; rating 30 VA

4 M C 3 2 8 7 – 1 1 Y 0 0 – 0 D

Example for Order No.: 4 M C 3 2 8 7 – 1 1 Y 0 0 – 0 D ■ ■

Order codes:

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes
Order No.: 4 M C 3 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ■ ■ ■

15th position
Rated secondary current

Rated current for 1st core	Rated current for 2nd core	Rated current for 3rd core	Rated current for 4th core			
1 A	Without	Without	Without	0	A	A
5 A	Without	Without	Without	0	A	B
1 A	1 A	Without	Without			C
5 A	5 A	Without	Without			D
1 A	5 A	Without	Without			E
5 A	1 A	Without	Without			F
1 A	1 A	1 A	Without			G
5 A	5 A	5 A	Without			H
1 A	1 A	1 A	1 A			J
5 A	5 A	5 A	5 A			K

16th position
Additional features

Options	
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval 1)	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

1) Only for class 0.2 and 0.5

Special versions

Options		
With routine test certificate in German/English		– Z A 1 0
Size (for specification see the following pages)	11	– Z A 1 1
	12	– Z A 1 2
	21	– Z A 2 1
	22	– Z A 2 2
	31	– Z A 3 1
	32	– Z A 3 2
	41	– Z A 4 1
	42	– Z A 4 2
	51	– Z A 5 1
	52	– Z A 5 2
	61	– Z A 6 1
	62	– Z A 6 2
	72	– Z A 7 2
	73	– Z A 7 3
Other special versions on request		

Configuration example

Indoor bar-primary bushing-type current transformer 4 M C 3
Maximum operating voltage U_m = 12 kV
Rated lightning impulse withstand voltage U_p = 75 kV 2
Rated short-duration power-frequency withstand voltage U_d = 28 kV
Rated short-time thermal current I_{th} = 400 kA 8 7 – 1 J
Rated primary current I_{PN} = 4000 A 0
Thermal strength 100 x I_{PN}
1st core class 0.5; instrument security factor FS10; rating 15 VA Y 0 – 0 D
2nd core class 0.2; instrument security factor FS10; rating 30 VA G
3rd core class 10P; accuracy limit factor 10; rating 30 VA 1
Rated secondary current 1st core 1 A; 2nd core 1 A; 3rd core 1 A – Z A 4 2
Power frequency 50 Hz; marking according to IEC
Size 42

Example for Order No.: 4 M C 3 2 8 7 – 1 J Y 0 – 0 D G 1 – Z A 4 2
Order codes: A

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000187

Size specification for 4MC32 transformers [1]

10th to 14th position of Order No.	6th to 9th position of Order No.							
	82-1F	84-1G	85-1H	87-1J	88-1K	90-1L	92-1N	93-1P
C30-0A C40-0A F30-0A F40-0A J40-0A J60-0A Q40-0A Q60-0A S60-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	41, 42, 51, 52, 61, 62, 72, 73
S80-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	12, 21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 61, 62, 72, 73	31, 32, 41, 42, 51, 52, 62, 72, 73	41, 42, 51, 52, 62, 72, 73
F30-4Q	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62, 72, 73	32, 42, 51, 52, 62, 72, 73	51, 52, 62, 72, 73
F30-6Q	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	12, 21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62, 72, 73	32, 42, 51, 52, 62, 72, 73	42, 51, 52, 62, 72, 73
F30-6S F40-6S	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	12, 21, 22, 31, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 61, 62	42, 51, 52, 62, 72, 73	42, 51, 52, 62, 72, 73
J60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	42, 52, 62, 72, 73
Q60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 32, 41, 42, 51, 52, 61, 62	32, 41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
S60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 32, 41, 42, 52, 61, 62	32, 41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
S80-8S	21, 22, 32	12, 21, 22, 32	21, 22, 31, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 62	41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
Y00-0A	11, 12, 21, 22, 31, 32	11,12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52	32, 42, 51, 52, 61, 62	52, 62, 72, 73	52, 62, 72, 73
Y00-0B	21, 22, 32	21, 22, 32	22, 32, 41, 42	22, 32, 42, 51, 52	22, 32, 42, 52	22, 42, 52, 62	42, 52, 62, 72, 73	52, 62, 72, 73
Y00-0C Y00-0D	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	12, 22, 32, 41, 42, 51, 52	22, 32, 42, 51, 52	52, 62, 72, 73	52, 62, 72, 73
Y00-1A Y00-1B Y00-1C	12, 22, 32	22, 32	22, 32, 42	22, 32, 42, 52	42, 52	52, 62	73	73
Y00-1D Y00-1E Y00-1F	22, 32	22, 32	22, 32, 42	41, 52	52	52, 62	73	73

1) Selection for transformers with rated secondary current 1 A. Sizes for 5 A on request

Size specification for 4MC34 transformers [1]

10th to 14th position of Order No.	6th to 9th position of Order No.							
	82-1F	84-1G	85-1H	87-1J	88-1K	90-1L	92-1N	93-1P
C30-0A C40-0A F30-0A F40-0A J40-0A J60-0A Q40-0A Q60-0A S60-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	41, 42, 51, 52, 61, 62, 72, 73
S80-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 61, 62, 72, 73	31, 32, 41, 42, 51, 52, 62, 72, 73	41, 42, 51, 52, 62, 72, 73
F30-4Q	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62, 72, 73	32, 42, 51, 52, 62, 72, 73	51, 52, 62, 72, 73
F30-6Q	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62, 72, 73	32, 42, 51, 52, 62, 72, 73	42, 51, 52, 62, 72, 73
F30-6S F40-6S	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 61, 62	42, 51, 52, 62, 72, 73	42, 51, 52, 62, 72, 73
J60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	42, 52, 62, 72, 73
Q60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 61, 62	32, 41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
S60-8S	21, 22, 31, 32	21, 22, 31, 32	21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 32, 41, 42, 52, 61, 62	42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
S80-8S	21, 22, 32	21, 22, 32	21, 22, 31, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 62	41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
Y00-0A	11, 12, 21, 22, 31, 32	11,12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 32, 42, 51, 52, 61, 62	22, 32, 42, 51, 52, 61, 62, 72, 73	42, 52, 62, 72, 73
Y00-0B	22, 32	21, 22, 32	22, 32, 41, 42	22, 32, 42, 51, 52	22, 32, 42, 52	22, 42, 52, 62	42, 52, 62, 72, 73	52, 62, 72, 73
Y00-0C Y00-0D	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	12, 21, 22, 31, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 32, 42, 51, 52	52, 62, 72, 73	52, 62, 72, 73
Y00-1A Y00-1B Y00-1C	12, 22, 32	22, 32	22, 32, 42	22, 32, 42, 52	42, 52	52, 62	73	73
Y00-1D Y00-1E Y00-1F	22, 32	22, 32	22, 32, 42	41, 52	52	52, 62	73	73

1) Selection for transformers with rated secondary current 1 A. Sizes for 5 A on request

ВЯРНО С ОРИГИНАЛА
MIG 23 EOOД СОФИЯ MIG 23 LTD

000188

Size specification for 4MC36 transformers [1]

10th to 14th position of Order No.	6th to 9th position of Order No.							
	82-1F	84-1G	85-1H	87-1J	88-1K	90-1L	92-1N	93-1P
C30-0A C40-0A F30-0A F40-0A J40-0A J60-0A Q40-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	11, 12, 21, 22, 31, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	41, 42, 51, 52, 61, 62, 72, 73
Q60-0A S60-0A	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42, 51, 52	11, 12, 21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	31, 32, 41, 42, 51, 52, 61, 62, 72, 73	41, 42, 51, 52, 61, 62, 72, 73
S80-0A	12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 61, 62	41, 42, 51, 52, 62, 72, 73	41, 42, 51, 52, 62, 72, 73
F30-4Q	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62	42, 52, 62, 72, 73	52, 62, 72, 73
F30-6Q	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 31, 32, 41, 42, 51, 52, 62	42, 52, 62, 72, 73	52, 62, 72, 73
F30-6S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	12, 21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	22, 32, 42, 51, 52, 61, 62	42, 52, 62, 72, 73	52, 62, 72, 73
F40-6S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 32, 41, 42, 51, 52, 61, 62	41, 42, 51, 52, 62, 72, 73	42, 52, 62, 72, 73
J60-8S	12, 21, 22, 31, 32	12, 21, 22, 31, 32	21, 22, 31, 32, 41, 42	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52	21, 22, 31, 32, 41, 42, 51, 52, 61, 62	41, 42, 51, 52, 61, 62, 72, 73	42, 52, 62, 72, 73
Q60-8S	21, 22, 31, 32	12, 21, 22, 31, 32	21, 22, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 61, 62	42, 51, 52	42, 52, 62, 72, 73
S60-8S	21, 22, 32	21, 22, 32	21, 22, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 41, 42, 51, 52, 61, 62	42, 52, 62, 72, 73	52, 62, 72, 73
S80-8S	21, 22, 32	31, 32, 42	21, 22, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52, 62	42, 52, 62, 72, 73	52, 62, 72, 73
Y00-0A	11, 12, 21, 22, 31, 32	11,12, 21, 22, 31, 32	21, 22, 31, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 42, 52, 61, 62	52	52, 62, 72, 73
Y00-0B	22, 32	22, 32	22, 32	22, 42, 52	42, 52	42, 52, 62	52	73
Y00-0C Y00-0D	11, 12, 21, 22, 31, 32	11, 12, 21, 22, 31, 32	21, 22, 31, 32, 41, 42	21, 22, 32, 41, 42, 51, 52	22, 32, 41, 42, 51, 52	22, 52, 62	73	73
Y00-1A Y00-1B Y00-1C	22, 32	22, 32	22, 32	42, 52	52	–	73	73
Y00-1D Y00-1E Y00-1F	22	22	22, 42	52	–	–	73	73

1) Selection for transformers with rated secondary current 1 A. Sizes for 5 A on request

4ME2 outdoor support-type current transformer

5th position
Operating voltage (maximum value)

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes
Order No.: 4 M E 2 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

Operating voltage U_m kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV		
12	75	28	4 M E 2 2	See page 55
24	125	50	4 M E 2 4	See page 55
36	170	70	4 M E 2 6	See page 55

6th to 9th position
Rated short-time thermal current/
Rated primary current

Rated short-time thermal current I_{th} kA	Rated primary current I_{PN} A	Rated primary current, with primary multi-ratio I_{PN} A	Thermal strength 300 x I_{PN}	200 x I_{PN}	100 x I_{PN}		
0.5	2x	5	■		■	0 0 – 3 A	See page 55
0.6	2x	10	■		■	0 1 – 3 B	See page 55
1	2x	5		■		0 3 – 3 A	See page 55
1.5	2x	15	■		■	0 7 – 3 D	See page 55
2.5	2x	25	■		■	1 6 – 3 F	See page 55
3	2x	15		■		1 7 – 3 D	See page 55
5	2x	25		■		2 5 – 3 F	See page 55
5	2x	50	■		■	2 5 – 3 J	See page 55
7.5	2x	75	■	■	■	3 2 – 3 L	See page 56
10	2x	50		■		3 6 – 3 J	See page 56
10	2x	100	■		■	3 6 – 3 M	See page 56
15	2x	75		■		4 3 – 3 L	See page 56
15	2x	150	■		■	4 3 – 3 P	See page 56
20	2x	100		■		4 8 – 3 M	See page 56
20	2x	200	■		■	4 8 – 3 Q	See page 56
25	2x	250	■		■	5 4 – 3 R	See page 56
30	2x	150		■		5 6 – 3 P	See page 56
30	2x	300	■		■	5 6 – 3 S	See page 56
40	2x	200		■		6 3 – 3 Q	See page 56
40	2x	400	■		■	6 3 – 3 T	See page 56
50	2x	250		■		6 7 – 3 R	See page 56
50	2x	500	■		■	6 7 – 3 U	See page 56
60	2x	300		■		7 0 – 3 S	See page 56
60	2x	600	■		■	7 0 – 3 V	See page 56

6th to 9th position continued on page 54

Configuration example
Outdoor support-type current transformer
Maximum operating voltage U_m = 24 kV
Rated lightning impulse withstand voltage U_p = 125 kV
Rated short-duration power-frequency withstand voltage U_d = 50 kV
Rated short-time thermal current I_{th} = 15 kA
Rated primary current I_{PN} = 2x 75 A

Example for Order No.: 4 M E 2 4 3 – 3 ■ ■ ■ ■
Order codes:

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000189

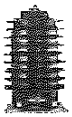
6th to 9th position (continued)
Rated short-time thermal current/ Rated primary current

Rated short-time thermal current I_{th} kA	Rated primary current I_{PN} A	Rated primary current, with primary multi-ratio I_{PN} A	Thermal strength 300 x I_{PN}	Thermal strength 200 x I_{PN}	Thermal strength 100 x I_{PN}	Position: 6 7 – 8 9	Order codes	
0.5	5		■		■	0 0 – 0 A		
0.6	10		■		■	0 1 – 0 B		
1	5			■		0 3 – 0 A		
1.5	15		■		■	0 7 – 0 D		
2	10			■		1 3 – 0 B		
2	20		■		■	1 3 – 0 E		
3	15			■		1 7 – 0 D		
3	30		■		■	1 7 – 0 G		
4	20			■		2 2 – 0 E		
4	40		■		■	2 2 – 0 H		
5	50		■		■	2 5 – 0 J		
6	30			■		2 6 – 0 G		
6	60		■		■	2 6 – 0 K		
7.5	75		■		■	3 2 – 0 L		
8	40			■		3 3 – 0 H		
10	50			■		3 6 – 0 J		
10	100		■		■	3 6 – 0 M		
12	60			■		3 8 – 0 K		
15	75			■		4 3 – 0 L		
15	150		■		■	4 3 – 0 P		
20	100			■		4 8 – 0 M		
20	200		■		■	4 8 – 0 Q		
25	250		■		■	5 3 – 0 R		
30	150			■		5 6 – 0 P		
30	300		■		■	5 6 – 0 S		
40	200			■		6 3 – 0 Q		
40	400		■		■	6 3 – 0 T		
50	250			■		6 7 – 0 R		
50	500		■		■	6 7 – 0 U		
60	300			■		7 0 – 0 S		
60	600		■		■	7 0 – 0 V		
80	400			■		7 3 – 0 T		
80	800		■		■	7 3 – 0 X		
100	500			■		7 5 – 0 U		
100	1000		■		■	7 5 – 1 A		
120	600			■		7 6 – 0 V		
120	1200		■		■	7 6 – 1 B		

See page 55
See page 55
See page 55
See page 55
See page 55
See page 56
See page 56
See page 56

Configuration example
Outdoor support-type current transformer
(U_m = 24 kV, U_p = 125 kV, U_d = 50 kV)
Rated short-time thermal current I_{th} = 100 kA
Rated primary current I_{PN} = 1000 A

Example for Order No.: 4 M E 2 4 7 5 – 1 A
Order codes:



10th to 14th position
Core versions

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes
Order No.: 4 M E 2 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ – ■ ■ ■

See page 56 See page 56 See page 56

At rated primary current I_{PN}	Thermal strength	10th position
0.5 0.6 1.5 2 2.5 3 4 5 6 7.5 10 15 20 25 30 40 50 60 80 100 120	100 x I_{PN}	0
1 2 3 4 5 6 8 10 12 15 20 30 40 50 60 80 100 120	200 x I_{PN}	2
0.5 0.6 1.5 2 2.5 3 4 5 6 7.5 10 15 20 25 30 40 50 60 80 100 120	300 x I_{PN}	3

1st core			2nd core			3rd core			Rated primary current I_{PN}			11th to 14th position
Class	Factor	VA rating	Class	Factor	VA rating	Class	Factor	VA rating	300 x I_{PN}	200 x I_{PN}	100 x I_{PN}	
0.2	FS10	5							■	■	■	C 1 – 0 A
		10							■	■	■	C 2 – 0 A
		15							■	■	■	C 3 – 0 A
		30							■	■	■	C 4 – 0 A
0.5	FS5	10							■	■	■	E 2 – 0 A
		15							■	■	■	E 3 – 0 A
		30							■	■	■	E 4 – 0 A
1	FS5	15							■	■	■	H 3 – 0 A
		30							■	■	■	H 4 – 0 A
5P	10	15							■	■	■	L 3 – 0 A
		30							■	■	■	L 4 – 0 A
		60							■	■	■	L 6 – 0 A
10P	10	15							■	■	■	Q 3 – 0 A
		30							■	■	■	Q 4 – 0 A
		60							■	■	■	Q 6 – 0 A
0.2	FS10	10	5P	10	30				■	■	■	C 2 – 4 L
		15			30				■	■	■	C 3 – 4 L
		30			60				■	■	■	C 4 – 6 L
0.5	FS5	10	5P	10	30				■	■	■	E 2 – 4 L
		15			30				■	■	■	E 3 – 4 L
		30			30				■	■	■	E 4 – 4 L
		30			60				■	■	■	E 4 – 6 L
1	FS5	15	5P	10	30				■	■	■	H 3 – 4 L
		30			30				■	■	■	H 4 – 4 L
		30			60				■	■	■	H 4 – 6 L
1	FS5	15	10P	10	30				■	■	■	H 3 – 4 Q
		30			30				■	■	■	H 4 – 4 Q
		30			60				■	■	■	H 4 – 6 Q
0.2	FS10	15	0.5	FS5	15	5P	10	15	■	■	■	Y 0 – 0 E
		15			30			30	■	■	■	Y 0 – 0 F
0.5	FS5	15	5P	10	15	5P	10	15	■	■	■	Y 0 – 0 G
		15			30			30	■	■	■	Y 0 – 0 H

■ Feasible (other combinations on request)

Configuration example
Outdoor support-type current transformer
(U_m = 24 kV, I_{th} = 100 kA, I_{PN} = 1000 A)
Thermal strength 300 x I_{PN}
1st core class 10P; instrument security factor 10; rating 60 VA
2nd core without
3rd core without

4 M E 2 4 7 5 – 1 A 3 Q 6 – 0 A

Example for Order No.: 4 M E 2 4 7 5 – 1 A Q 6 3 – 0 A
Order codes

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000190

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes

Order No.: 4 M E 2 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ■ ■ ■

15th position
Rated secondary current

Rated current for 1st core	Rated current for 2nd core	Rated current for 3rd core	
1 A	Without	Without	0 A A
5 A	Without	Without	0 A B
1 A	1 A	Without	C
5 A	5 A	Without	D
1 A	5 A	Without	E
5 A	1 A	Without	F
1 A	1 A	1 A	G
5 A	5 A	5 A	H

16th position
Additional features

Options	
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval [1]	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

1) Only for class 0.2 and 0.5

Special versions

Options		
With routine test certificate in German/English	– Z	A 1 0
Size (for specification see the following page)	– Z	A 0 0
	0	– Z A 0 1
	1	– Z A 0 2
	2	– Z A 0 3
	3	
Other special versions on request		

Configuration example

Outdoor support-type current transformer — 4 M E 2
Maximum operating voltage U_m = 24 kV — 4
Rated lightning impulse withstand voltage U_p = 125 kV
Rated short-duration power-frequency withstand voltage U_d = 50 kV — 7 5 – 1 A
Rated short-time thermal current I_{th} = 100 kA — 3
Rated primary current I_{PN} = 1000 A
Thermal strength 300 x I_{PN} — Q 6 – 0 A
1st core class 10P; instrument security factor 10; rating 60 VA — B
2nd core without — 1
3rd core without — – Z A 0 1
Rated secondary current 1st core 5 A; 2nd core without; 3rd core without
Power frequency 50 Hz; marking according to IEC
Size 1

Example for Order No.: 4 M E 2 4 7 5 – 1 A Q 6 3 – 0 A B 1 – Z A 0 1
Order codes: A 0 1

Size specification for 4ME2 transformers

Order No.	Up to 12 kV			At 24 kV		At 36 kV
	with rated short-time thermal current					
	$100 \times I_{PN}$	$200 \times I_{PN}$	$300 \times I_{PN}$	$100 \times I_{PN}$	$200 \times I_{PN}$	$100 \times I_{PN}$
...C1.-0A...	1	1	1	1	1	1
...C2.-0A...	1	1	1	1	1	1
...C3.-0A...	1	1	1	1	1	1
...C4.-0A...	1	1	1	1	1	1
...E2.-0A...	1	1	1	1	1	1
...E3.-0A...	1	1	1	1	1	1
...E4.-0A...	1	1	1	1	1	1
...H3.-0A...	1	1	1	1	1	1
...H4.-0A...	1	1	1	1	1	1
...L3.-0A...	1	1	1	1	1	1
...L4.-0A...	1	1	2	1	1	1
...L6.-0A...	2	2	2	1	2	1
...Q3.-0A...	1	1	1	1	1	1
...Q4.-0A...	1	1	2	1	1	1
...Q6.-0A...	2	2	2	1	2	2
...C2.-4L...	1	2	2	1	2	2
...C3.-4L...	1	1	2	1	2	2
...C4.-6L...	2	2	2	2	2	2
...E2.-4L...	1	1	2	1	2	2
...E3.-4L...	1	1	2	2	2	1
...E4.-4L...	1	2	2	2	2	1
...E4.-6L...	2	2	2	2	2	2
...H3.-4L...	1	2	2	1	2	2
...H4.-4L...	1	2	2	1	2	2
...H4.-6L...	2	2	2	2	2	2
...H3.-4Q...	1	2	2	1	2	2
...H4.-4Q...	1	2	2	1	2	2
...H4.-6Q...	2	2	2	2	2	2
...Y0.-0E...	2	2	2	1	2	2
...Y0.-0F...	2	2	2	2	2	2
...Y0.-0G...	2	2	2	2	2	2
...Y0.-0H...	2	2	2	2	2	2

2

ВЯРНО С ОРИГИНАЛА
МГ 23 ЕООД София MIG 23 LTD

000191

4ME3 outdoor support-type current transformer

5th position
Operating voltage (maximum value)

Operating voltage U_m kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 –	Order codes	
			Order No.: 4 M E 3 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★	■ ■ ■	
				See page	
12	75	28	4 M E 3 2	60	
24	125	50	4 M E 3 4	60	
36	170	70	4 M E 3 6	60	
52	250	95	4 M E 3 B	61	
				61	
				61	
				61	

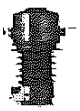
6th to 9th position
Rated short-time thermal current/
Rated primary current

Rated short-time thermal current I_{th} kA	Rated primary current I_{PN} A	Rated primary current, with primary multiratio I_{PN} A	Thermal strength 300 x I_{PN}	200 x I_{PN}	100 x I_{PN}								
0.5	2x	5	■		■	0	0	–	3	A			
0.6	2x	10	■		■	0	1	–	3	B			
1	2x	5		■		0	3	–	3	A			
1.5	2x	15	■		■	0	7	–	3	D			
2.5	2x	25	■		■	1	6	–	3	F			
3	2x	15		■		1	7	–	3	D			
5	2x	25		■		2	5	–	3	F			
5	2x	50	■		■	2	5	–	3	J			
7.5	2x	75	■	■	■	3	2	–	3	L			
10	2x	50		■		3	6	–	3	J			
10	2x	100	■		■	3	6	–	3	M			
15	2x	75		■		4	3	–	3	L			
15	2x	150	■		■	4	3	–	3	P			
20	2x	100		■		4	8	–	3	M			
20	2x	200	■		■	4	8	–	3	Q			
25	2x	250	■		■	5	4	–	3	R			
30	2x	150		■		5	6	–	3	P			
30	2x	300	■		■	5	6	–	3	S			
40	2x	200		■		6	3	–	3	Q			
40	2x	400	■		■	6	3	–	3	T			
50	2x	250		■		6	7	–	3	R			
50	2x	500	■		■	6	7	–	3	U			
60	2x	300		■		7	0	–	3	S			
60	2x	600	■		■	7	0	–	3	V			

6th to 9th position continued on page 59

Configuration example
Outdoor support-type current transformer
Maximum operating voltage U_m = 52 kV
Rated lightning impulse withstand voltage U_p = 250 kV
Rated short-duration power-frequency withstand voltage U_d = 95 kV
Rated short-time thermal current I_{th} = 25 kA
Rated primary current I_{PN} = 2x 250 A

Example for Order No.: 4 M E 3 B 5 4 – 3 R ■ ■ ■ – ■ ■ ■ ■ ■
Order codes:



6th to 9th position (continued)
Rated short-time thermal current/ Rated primary current

Rated short-time thermal current I_{th} kA	Rated primary current I_{PN} A	Rated primary current, with primary multiratio I_{PN} A	Thermal strength 300 x I_{PN}	Thermal strength 200 x I_{PN}	Thermal strength 100 x I_{PN}	6	7	8	9	
0.5	5		■		■	0	0	0	A	
0.6	10		■		■	0	1	0	B	
1	5			■		0	3	0	A	
1.5	15		■		■	0	7	0	D	
2	10			■		1	3	0	B	
2	20		■		■	1	3	0	E	
3	15			■		1	7	0	D	
3	30		■		■	1	7	0	G	
4	20			■		2	2	0	E	
4	40		■		■	2	2	0	H	
5	50		■		■	2	5	0	J	
6	30			■		2	6	0	G	
6	60		■		■	2	6	0	K	
7.5	75		■		■	3	2	0	L	
8	40			■		3	3	0	H	
10	50			■		3	6	0	J	
10	100		■		■	3	6	0	M	
12	60			■		3	8	0	K	
15	75			■		4	3	0	L	
15	150		■		■	4	3	0	P	
20	100			■		4	8	0	M	
20	200		■		■	4	8	0	Q	
25	250		■		■	5	3	0	R	
30	150			■		5	6	0	P	
30	300		■		■	5	6	0	S	
40	200			■		6	3	0	Q	
40	400		■		■	6	3	0	T	
50	250			■		6	7	0	R	
50	500		■		■	6	7	0	U	
60	300			■		7	0	0	S	
60	600		■		■	7	0	0	V	
80	400			■		7	3	0	T	
80	800		■		■	7	3	0	X	
100	500			■		7	5	0	U	
100	1000		■		■	7	5	1	A	
120	600			■		7	6	0	V	
120	1200		■		■	7	6	1	B	
150	1500				■	7	8	1	D	
200	2000				■	8	2	1	F	
250	2500				■	8	4	1	G	
300	3000				■	8	5	1	H	

See page 60
See page 60
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See page 61
See page 61
See page 61

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes
Order No.: 4 M E 3 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ■ ■ ■

Configuration example
Outdoor support-type current transformer
(U_m = 52 kV, U_p = 250 kV, U_d = 95 kV)
Rated short-time thermal current I_{th} = 100 kA
Rated primary current I_{PN} = 1000 A

Example for Order No.: 4 M E 3 B 7 5 – 1 A ■ ■ ■
Order codes:

ВЯРНО С ОРИГИНАЛА
MIG 23 EOOD СОФИЯ MIG 23 LTD. 0001927

Equipment Selection

4ME3 outdoor support-type current transformer

10th to 14th position
Core versions

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 — Order codes
Order No.: 4 M E 3 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ – ■ — Order codes

At rated primary current I_{PN}	Thermal strength	10 11 12	See page
0.5 0.6 1.5 2 2.5 3 4 5 6 7.5 10 15 20 25 30 40 50 60 80 100 120 150 200 250 300	100 x I_{PN}	0	61
1 2 3 4 5 6 8 10 12 15 20 30 40 50 60 80 100 120	200 x I_{PN}	2	61
0.5 0.6 1.5 2 2.5 3 4 5 6 7.5 10 15 20 25 30 40 50 60 80 100 120	300 x I_{PN}	3	61

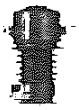
1st core Class	1st core Factor	1st core VA rating	2nd core Class	2nd core Factor	2nd core VA rating	3rd core Class	3rd core Factor	3rd core VA rating	Rated primary current 300 x I_{PN}	200 x I_{PN}	100 x I_{PN}	13 14 15 16
0.2	FS10	5							■	■	■	C 1 – 0 A
		10							■	■	■	C 2 – 0 A
		15							■	■	■	C 3 – 0 A
		30							■	■	■	C 4 – 0 A
0.5	FS5	10							■	■	■	E 2 – 0 A
		15							■	■	■	E 3 – 0 A
		30							■	■	■	E 4 – 0 A
1	FS5	15							■	■	■	H 3 – 0 A
		30							■	■	■	H 4 – 0 A
5P	10	15							■	■	■	L 3 – 0 A
		30							■	■	■	L 4 – 0 A
		60							■	■	■	L 6 – 0 A
10P	10	15							■	■	■	Q 3 – 0 A
		30							■	■	■	Q 4 – 0 A
		60							■	■	■	Q 6 – 0 A
0.2	FS10	10	5P	10	30				■	■	■	C 2 – 4 L
		15			30				■	■	■	C 3 – 4 L
		30			60				■	■	■	C 4 – 6 L
0.5	FS5	10	5P	10	30				■	■	■	E 2 – 4 L
		15			30				■	■	■	E 3 – 4 L
		30			30				■	■	■	E 4 – 4 L
		30			60				■	■	■	E 4 – 6 L
1	FS5	15	5P	10	30				■	■	■	H 3 – 4 L
		30			30				■	■	■	H 4 – 4 L
		30			60				■	■	■	H 4 – 6 L
1	FS5	15	10P	10	30				■	■	■	H 3 – 4 Q
		30			30				■	■	■	H 4 – 4 Q
		30			60				■	■	■	H 4 – 6 Q
0.2	FS10	15	0.5	FS5	15	5P	10	15	■	■	■	Y 0 – 0 E
		15			30			30	■	■	■	Y 0 – 0 F
0.5	FS5	15	5P	10	15	5P	10	15	■	■	■	Y 0 – 0 G
		15			30			30	■	■	■	Y 0 – 0 H

■ Feasible (other combinations on request)

Configuration example
Outdoor support-type current transformer
(U_m = 52 kV, I_{th} = 100 kA, I_{PN} = 1000 A)
Thermal strength 300 x I_{PN}
1st core class 10P; instrument security factor 10; rating 60 VA
2nd core without
3rd core without

4 M E 3 8 7 5 – 1 A 3 Q 6 – 0 A

Example for Order No.: 4 M E 3 8 7 5 – 1 A Q 6 3 – 0 A ■ ■
Order codes:



15th position
Rated secondary current

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes
Order No.: 4 M E 3 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

Rated current for 1st core	Rated current for 2nd core	Rated current for 3rd core	
1 A	Without	Without	0 A A
5 A	Without	Without	0 A B
1 A	1 A	Without	C
5 A	5 A	Without	D
1 A	5 A	Without	E
5 A	1 A	Without	F
1 A	1 A	1 A	G
5 A	5 A	5 A	H

16th position
Additional features

Options	
50 Hz, VDE marking	0
50 Hz, IEC marking	1
50 Hz, VDE marking with approval 1)	2
60 Hz, IEC marking	6
Further not listed special versions (only after consultation with the order processing department in the Switchgear Factory Berlin). Information additionally in clear text.	9

1) Only for class 0.2 and 0.5

Special versions

Optionen	
With routine test certificate in German/English	– Z A 1 0
Other special versions on request	

Configuration example

Outdoor support-type current transformer — 4 M E 3
Maximum operating voltage U_m = 52 kV — B
Rated lightning impulse withstand voltage U_p = 250 kV
Rated short-duration power-frequency withstand voltage U_d = 95 kV — 7 5 – 1 A
Rated short-time thermal current I_{th} = 100 kA — 3
Rated primary current I_{PN} = 1000 A
Thermal strength 300 × I_{PN} — Q 6 – 0 A
1st core class 10P; instrument security factor 10; rating 60 VA — B
2nd core without
3rd core without — 1
Rated secondary current 1st core 5 A; 2nd core without; 3rd core without
Power frequency 50 Hz; marking according to IEC

Example for Order No.: 4 M E 3 B 7 5 – 1 A Q 6 – 0 A B 1
Order codes:

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000193

Voltage transformers, type of construction according to IEC [1)]

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16 Order codes

Order No.: 4 M ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – ★ ■ ■ ■

Illustration	Type of design	Order No.	
 R-HG24-058.eps	Indoor voltage transformer, block-type design, small type of construction according to DIN 42600, single-phase cast-resin insulated, operating voltage up to 12 kV or 24 kV	4 M R 1	Selection from page **63ff**
 R-HG24-059.eps	Indoor voltage transformer, block-type design, small type of construction according to DIN 42600, double-phase cast-resin insulated, operating voltage up to 12 kV or 24 kV	4 M R 2	Selection from page **63ff**
 R-HG24-063.eps	Indoor voltage transformer, block-type design, large type of construction according to DIN 42600, single-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4 M R 5	Selection from page **63ff**
 R-HG24-064.eps	Indoor voltage transformer, block-type design, large type of construction according to DIN 42600, double-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4 M R 6	Selection from page **63ff**
 R-HG24-065.eps	Outdoor voltage transformer, small type of construction, single-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV, 36 kV or 52 kV	4 M S 3	Selection from page **63ff**
 R-HG24-055.eps	Outdoor voltage transformer, small type of construction, double-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV, 36 kV or 52 kV	4 M S 4	Selection from page **63ff**
 R-HG24-066.eps	Outdoor voltage transformer, large type of construction, single-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4 M S 5	Selection from page **63ff**
 R-HG24-067.eps	Outdoor voltage transformer, large type of construction, double-phase cast-resin insulated, operating voltage up to 12 kV, 24 kV or 36 kV	4 M S 6	Selection from page **63ff**

1) Transformers according to ANSI standard on request

2

Example for Order No.: 4 M S 3 ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■
Order codes:

Maximum operating voltage U_{max} = 52 kV

12 kV

50/60 Hz

Maximum operating voltage U_{max} kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated primary voltage U_{prim} kV	Type 4MR1 – single-phase	Type 4MR2 – double-phase	Type 4MR5 – single-phase	Type 4MR6 – double-phase	Type 4MS3 – single-phase	Type 4MS4 – double-phase	Type 4MS5 – single-phase	Type 4MS6 – double-phase	Position: 1 2 3 4 5 6 7 – 8 9 10 11 12	Order codes
												Order No.: 4 M ■ ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ★	■ ■ ■
12	75	28	$3.3/\sqrt{3}$	■		■						2 0 8	
			3.3		■		■					2 0 8	
			$3.6/\sqrt{3}$	■		■						2 7 0	
			3.6		■		■					2 7 0	
			$4.8/\sqrt{3}$	■		■						2 7 1	
			4.8		■		■					2 7 1	
			5 $/\sqrt{3}$	■		■		■		■		2 1 3	
			5		■		■		■		■	2 1 3	
			6 $/\sqrt{3}$	■		■		■		■		2 1 5	
			6		■		■		■		■	2 1 5	
			$6.6/\sqrt{3}$	■		■		■		■		2 1 7	
			6.6		■		■		■		■	2 1 7	
			$7.2/\sqrt{3}$	■		■						2 2 2	
			7.2		■		■					2 2 2	
			10 $/\sqrt{3}$	■		■		■		■		2 2 7	
			10		■		■		■		■	2 2 7	
			11 $/\sqrt{3}$	■		■		■		■		2 3 0	
			11		■		■		■		■	2 3 0	
			6–10 $/\sqrt{3}$			■						2 6 1	
			6–10				■					2 6 1	
			Others	■	■	■	■					2 9 9	

See page 65
See page 65
See page 66
See page 66
See page 67
See page 67

2

Configuration example
Voltage transformer
Outdoor design, single-phase
Rated primary voltage U_{prim} = $6.6/\sqrt{3}$ kV

4 M S 3 2 1 7

Example for Order No.: 4 M S 3 2 1 7 – ■ ■ ■ ■ ■
Order codes:

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000194

24 kV

50/60 Hz

Position:	1	2	3	4	5	6	7	–	8	9	10	11	12					–		Order codes		
Order No.:	4	M	■	■	■	■	■	–	■	■	■	■	■					–	★	■	■	■

U_{max} Maximum operating voltage kV	U_p Rated lightning impulse withstand voltage kV	U_d Rated short-duration power-frequency withstand voltage kV	U_{prim} Rated primary voltage kV	Type 4MR1 – single-phase	Type 4MR2 – double-phase	Type 4MR5 – single-phase	Type 4MR6 – double-phase	Type 4MS3 – single-phase	Type 4MS4 – double-phase	Type 4MS5 – single-phase	Type 4MS6 – double-phase	See page 65	See page 65	See page 66	See page 66	See page 67	See page 67
24	125	50	13.8/√3	■		■		■		■		4	3	5			
			13.8		■		■		■		■	4	3	5			
			15 /√3	■		■		■		■		4	3	8			
			15		■		■		■		■	4	3	8			
			17.5/√3	■		■		■		■		4	7	2			
			17.5		■		■		■		■	4	7	2			
			20 /√3	■		■		■		■		4	4	2			
			20		■		■		■		■	4	4	2			
			22 /√3	■		■		■		■		4	4	3			
			22		■		■		■		■	4	4	3			
			10–20 /√3	■		■		■		■		4	6	5			
			10–20		■		■		■		■	4	6	5			
			15–20 /√3	■		■						4	6	2			
			15–20		■		■					4	6	2			
			Others	■	■	■	■					4	9	9			

36 kV

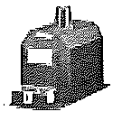
50/60 Hz

U_{max} kV	U_p kV	U_d kV	U_{prim} kV	4MR1	4MR2	4MR5	4MR6	4MS3	4MS4	4MS5	4MS6
36	170	70	20 /√3			■					
			20				■				
			22 /√3			■					
			22				■				
			25 /√3			■		■		■	
			25				■		■		■
			30 /√3			■		■		■	
			30				■		■		■
			33 /√3			■		■		■	
			33				■		■		■
			35 /√3			■		■		■	
			35				■		■		■
			20–30 /√3			■					
			20–30				■				
			Others			■	■				

Order codes		
6	4	2
6	4	2
6	4	3
6	4	3
6	4	5
6	4	5
6	4	6
6	4	6
6	4	7
6	4	7
6	4	8
6	4	8
6	6	4
6	6	4
6	9	9

Configuration example
Voltage transformer
Outdoor design, single-phase
Rated primary voltage $U_{prim} = 20/\sqrt{3}$ kV

	4	M																				
			5	3																		
					4	4	2															
Example for Order No.:	4	M	5	3	4	4	2	–	■	■	■	■	■					–	★	■	■	■
Order codes:																						



52 kV

50/60 Hz

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 Order codes

Order No.: 4 M ■ ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ★ ■ ■ ■

Maximum operating voltage U_{max} kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated primary voltage U_{prim} kV	Type 4MR1 – single-phase	Type 4MR2 – double-phase	Type 4MR5 – single-phase	Type 4MR6 – double-phase	Type 4MS3 – single-phase	Type 4MS4 – double-phase	Type 4MS5 – single-phase	Type 4MS6 – double-phase			
52	250	95	$33/\sqrt{3}$					■				8	4	7
			$35/\sqrt{3}$					■				8	4	8
			$40/\sqrt{3}$					■				8	5	0
			$45/\sqrt{3}$					■				8	5	1

See page 66 | See page 66 | See page 67 | See page 67

8th position
Auxiliary residual voltage winding

Voltage V	4MR1	4MR2	4MR5	4MR6	4MS3	4MS4	4MS5	4MS6	
Without auxiliary winding	■	■	■	■	■	■	■	■	0
100/3	■		■		■		■		1
110/3	■		■		■		■		2
120/3	■		■		■		■		3

9th position
Rated secondary voltage

Voltage V	4MR1	4MR2	4MR5	4MR6	4MS3	4MS4	4MS5	4MS6	
$100/\sqrt{3}$	■		■		■		■		A
100		■		■		■		■	A
$110/\sqrt{3}$	■		■		■		■		B
110		■		■		■		■	B
$120/\sqrt{3}$	■		■		■		■		C
120		■		■		■		■	C

Configuration example
Voltage transformer
Outdoor design, single-phase
Rated primary voltage with multi-ratio $U_{prim} = 35/\sqrt{3}$ kV
Without auxiliary residual voltage winding
Rated secondary voltage $U_{sec} = 110$ V

Example for Order No.: 4 M 5 3 8 4 8 – 0 B ■ ■ ■

Order codes:

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000195

10th/11th position
Rated output of measuring winding and accuracy class

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 — Order codes

Order No.: 4 M ■ ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ★ ■ ■ ■

Voltage level U_{max} kV	Class %	Rated output S_N VA	Type 4MR1 – single-phase	Type 4MR2 – double-phase	Type 4MR5 – single-phase	Type 4MR6 – double-phase	Type 4MS3 – single-phase	Type 4MS4 – double-phase	Type 4MS5 – single-phase	Type 4MS6 – double-phase	See page 67	See page 67
12	0.2	20	■	■							E	1
	0.2	30			■	■	■	■	■	■	G	1
	0.5	50	■	■							K	2
	0.5	90						■		■	N	2
	0.5	100			■	■	■		■		P	2
	1	100	■	■							P	3
	1	180						■		■	S	3
	1	200			■	■	■		■		T	3
24	0.2	20	■	■							E	1
	0.2	25						■		■	F	1
	0.2	30					■		■		G	1
	0.2	45			■	■					J	1
	0.5	50	■	■							K	2
	0.5	75						■		■	M	2
	0.5	100			■	■	■		■		P	2
	1	100	■	■							P	3
	1	150						■		■	R	3
	1	200			■	■	■		■		T	3
36	0.2	25					■		■		F	1
	0.2	50			■	■					K	1
	0.2	60						■		■	L	1
	0.5	75					■		■		M	2
	0.5	100			■	■					P	2
	0.5	150						■		■	R	2
	1	150					■		■		R	3
	1	200			■	■					T	3
	1	400						■		■	V	3
52	0.2	60					■		■		L	1
	0.5	180					■		■		S	2
	1	400					■		■		V	3

Configuration example
Voltage transformer
Outdoor design, single-phase
Rated output of measuring winding 180 VA
Accuracy class 0.5

4 M
S 3 8 4 8 – 0 B
S 2

Example for Order No.: 4 M S 3 8 4 8 – 0 B S 2 ■
Order codes:

12th position
Additional features

Position: 1 2 3 4 5 6 7 – 8 9 10 11 12 – ★ Order codes
Order No.: 4 M ■ ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ★ ■ ■ ■

Options	4MR1	4MR2	4MR5	4MR6	4MS3	4MS4	4MS5	4MS6	12th position
50 Hz, VDE marking	■	■	■	■	■	■	■	■	0
50 Hz, IEC marking	■	■	■	■	■	■	■	■	1
50 Hz, VDE marking with approval [1]	■	■	■	■	■	■	■	■	2
60 Hz, IEC marking	■	■	■	■	■	■	■	■	6
Other features on request	■	■	■	■	■	■	■	■	9

1) Only for class 0.2 and 0.5

Additional equipment

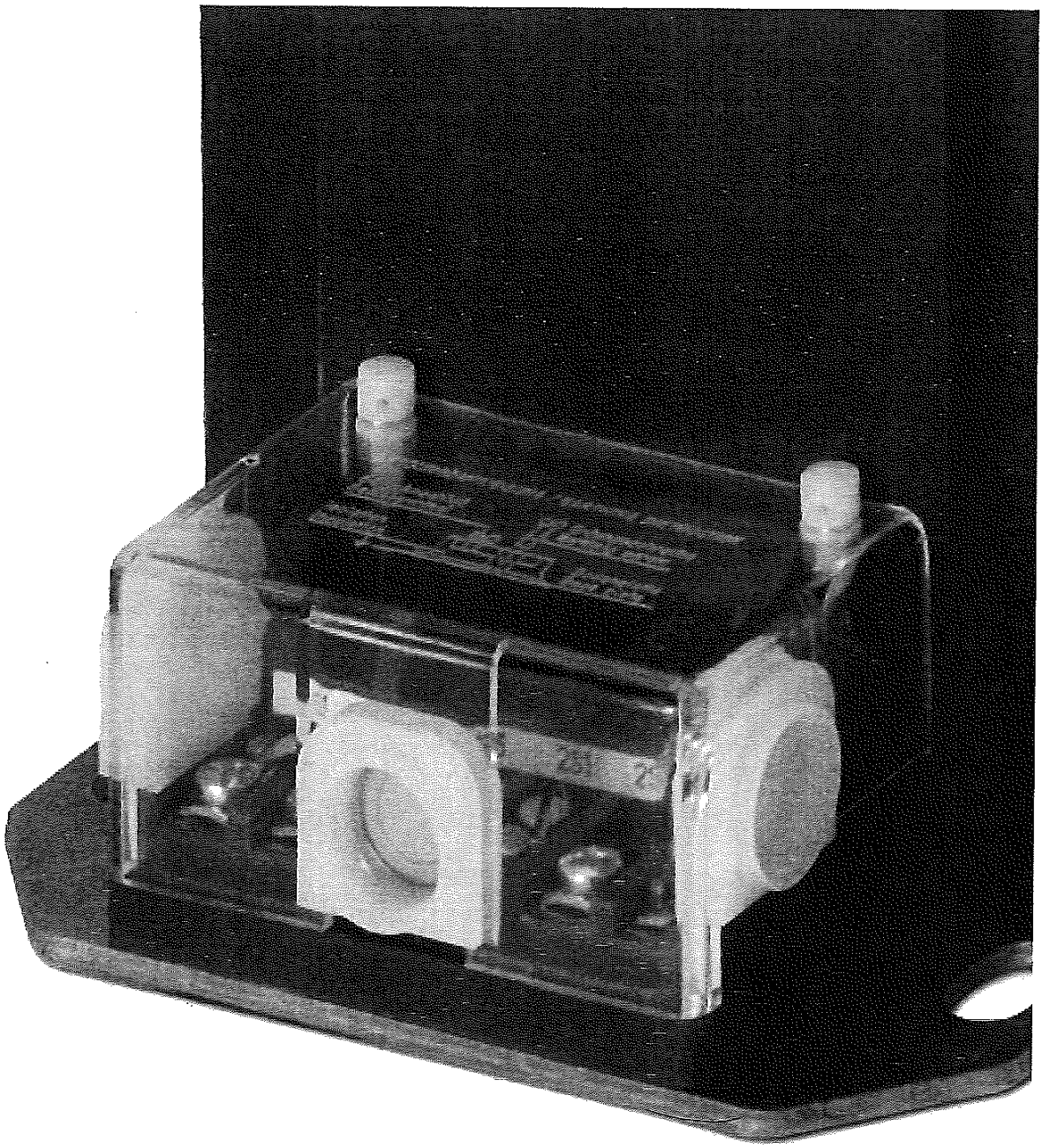
Options	Type 4MR1 – single-phase	Type 4MR2 – double-phase	Type 4MR5 – single-phase	Type 4MR6 – double-phase	Type 4MS3 – single-phase	Type 4MS4 – double-phase	Type 4MS5 – single-phase	Type 4MS6 – double-phase	★ Order codes
With routine test certificate in German/English	■	■	■	■	■	■	■	■	– Z A 1 0

Configuration example
Voltage transformer
Outdoor design, single-phase, cast-resin insulated
Rated primary voltage with multi-ratio $U_{prim} = 35/\sqrt{3}$ kV
Without auxiliary residual voltage winding
Rated secondary voltage $U_{sec} = 110$ V
Rated output of measuring winding 180 VA
Accuracy class 0.5
Additional features 50 Hz, IEC marking
With routine test certificate in German/English

Example for Order No.: 4 M S 3 8 4 8 – 0 B S 2 1 – Z
Order codes: A 1 0

ВЯРНО С ОРИГИНАЛА
MIG 23 LTD. СОФИЯ 000196

2



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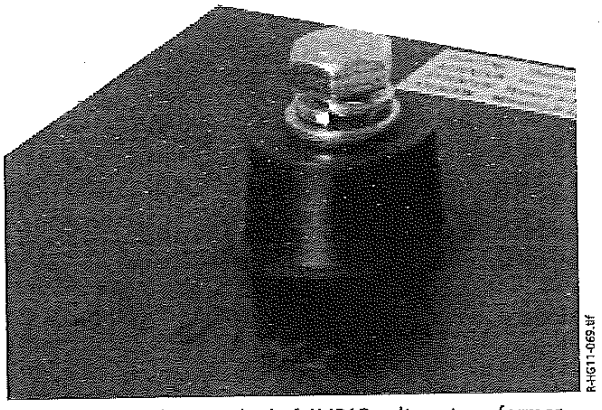

Primary connection terminal of 4MR12 voltage transformer

Contents | Page

3

ВЯРНО С ОРИГИНАЛА
МИГ 23 ЕООД
СОФИЯ
MIG 23 LTD

000197

Order No.	Operating voltage (maximum value) U_m	Rated short-duration power-frequency withstand voltage U_d	Rated lightning impulse withstand voltage U_p	Rated frequency	Rated primary current I_{PN}	Multi-ratio	Secondary current I_{SN}	Maximum rated continuous thermal current	Rated short-time thermal current (minimum 100 x I_{PN}) I_{th}	Rated dynamic current (I_{dyn} 2.5 x I_{th}) I_{dyn}	Number of cores	Short-time load (mechanical)	Weight	Catalog dimension drawing
	kV	kV	kV	Hz	A		kA	x I_{PN}	kA	kA	maximum	N	kg	
4MA72	12	28	75	50/60	20 to 2500	2 x 20 to 2 x 600	1/5	1.2	80	120	–	5000	20	1
4MA72...Z F18	17.5	38	95	50/60	20 to 2500	2 x 20 to 2 x 600	1/5	1.2	80	120	–	5000	20	1
4MA74	24	50	125	50/60	20 to 2500	2 x 20 to 2 x 600	1/5	1.2	80	120	–	5000	25	2
4MA76	36	70	170	50/60	20 to 2000	2 x 20 to 2 x 600	1/5	1.2	80	120	–	5000	35	3
4MB12	12	28	75	50/60	1500 to 4000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	3000	19 or 26	4
4MB13	12	28	75	50/60	1500 to 6000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	3000	34	4
4MB14	24[1]	50[1]	125[1]	50/60	1500 to 4000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	3000	26	4
4MC22	12	28	75	50/60	150 to 3000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	5000	12 to 48	5
4MC24	24	50	125	50/60	150 to 3000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	5000	28 to 48	5
4MC26	36	70	170	50/60	150 to 3000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	3	5000	35 to 48	5
4MC32	12	28	75	50/60	2000 to 10000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	4	5000	32 to 150	6
4MC34	24	50	125	50/60	2000 to 10000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	4	5000	32 to 150	7
4MC36	36	70	170	50/60	2000 to 10000	only possible on secondary side	1/5	1.2	100 x I_{PN}	practically unlimited	4	5000	32 to 150	8
4ME22	12	28	75	50/60	5 to 1200	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	2400	22	9/10
4ME24	24	50	125	50/60	5 to 1200	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	2400	22	9/10
4ME26	36	70	170	50/60	5 to 1200	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	2000	22	11/12
4ME32	12	28	75	50/60	5 to 3000	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	5000	65	13
4ME34	24	50	125	50/60	5 to 3000	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	5000	65	13
4ME36	36	70	170	50/60	5 to 3000	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	5000	65	14
4ME38	52	95	250	50/60	5 to 3000	2 x 5 to 2 x 600	1/5	1.2	80	2.5 x I_{th}	3	5000	65	15

1) Also possible on request: U_m = 17.5, U_d = 38 kV and U_p = 75 kV

Size specification for 4MC2 transformers

10th to 14th position of Order No.	6th to 9th position of Order No.												
	43-0P	48-0Q	56-0S	63-0T	67-0U	70-0V	73-0X	75-1A	76-1B	78-1D	82-1F	84-1G	86-1H
Sizes of 4MC22 transformers													
C20-0A	1	0	0	0	0	0	0	0	0	0	0	0	21
C30-0A	2	0	0	0	0	0	0	0	0	0	0	0	21
E30-0A	1	0	0	0	0	0	0	0	0	0	0	0	21
E40-0A	2	0	0	0	0	0	0	0	0	0	0	0	21
H30-0A	0	0	0	0	0	0	0	0	0	0	0	0	21
H40-0A	1	2	2	2	2	2	2	2	2	2	2	2	21
Q30-0A	2	1	0	0	0	0	0	0	0	0	0	0	21
Q40-0A	2	1	1	1	0	0	0	0	0	0	0	0	21
Q60-0A	21	3	2	1	1	0	0	0	1	1	1	1	21
C20-4Q	3	2	1	0	0	0	0	0	0	0	0	0	21
C30-4Q	3	2	1	1	0	0	0	0	0	0	0	0	21
E30-3Q	3	2	1	0	0	0	0	0	0	0	0	0	21
E30-4Q	3	2	1	0	0	0	0	0	0	0	0	0	21
E40-4Q	3	2	1	0	0	0	0	0	0	0	0	0	21
E40-6Q	–	21	3	2	2	1	1	1	1	2	2	2	21
H30-3Q	1	1	0	0	0	0	0	0	0	0	0	0	21
H30-4Q	2	2	1	0	0	0	0	0	0	0	0	0	21
H40-4Q	2	2	1	0	0	0	0	0	0	0	0	0	21
H40-6Q	–	21	2	2	1	1	1	1	1	2	2	2	21
Sizes of 4MC24 transformers													
C20-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
C30-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
E30-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
E40-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
H30-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
H40-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
Q30-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
Q40-0A	1	1	1	1	1	1	1	1	1	1	1	11	11
Q60-0A	11	2	1	1	1	1	1	1	1	1	1	11	11
C20-4Q	2	1	1	1	1	1	1	1	1	1	1	11	11
C30-4Q	2	1	1	1	1	1	1	1	1	1	1	11	11
E30-3Q	2	2	1	1	1	1	1	1	1	1	1	11	11
E30-4Q	2	2	1	1	1	1	1	1	1	1	1	11	11
E40-4Q	2	2	1	1	1	1	1	1	1	1	1	11	11
E40-6Q	–	11	2	1	1	1	1	1	1	1	1	11	11
H30-3Q	1	1	1	1	1	1	1	1	1	1	1	11	11
H30-4Q	1	1	1	1	1	1	1	1	1	1	1	11	11
H40-4Q	2	1	1	1	1	1	1	1	1	1	1	11	11
H40-6Q	–	11	2	1	1	1	1	1	1	1	1	11	11
Sizes of 4MC26 transformers													
C20-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
C30-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
E30-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
E40-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
H30-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
H40-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
Q30-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
Q40-0A	1	1	1	1	1	1	1	1	1	1	01	01	01
Q60-0A	–	01	1	1	1	1	1	1	1	1	01	01	01
C20-4Q	01	1	1	1	1	1	1	1	1	1	01	01	01
C30-4Q	01	1	1	1	1	1	1	1	1	1	01	01	01
E30-3Q	01	1	1	1	1	1	1	1	1	1	01	01	01
E30-4Q	01	1	1	1	1	1	1	1	1	1	01	01	01
E40-4Q	01	1	1	1	1	1	1	1	1	1	01	01	01
E40-6Q	–	–	1	1	1	1	1	1	1	1	01	01	01
H30-3Q	1	1	1	1	1	1	1	1	1	1	01	01	01
H30-4Q	1	1	1	1	1	1	1	1	1	1	01	01	01
H40-4Q	01	1	1	1	1	1	1	1	1	1	01	01	01
H40-6Q	–	–	1	1	1	1	1	1	1	1	01	01	01

3

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СОФИЯ

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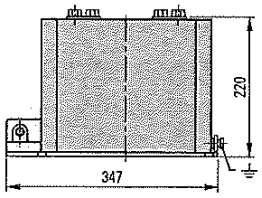
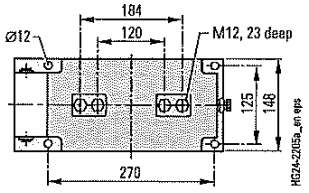
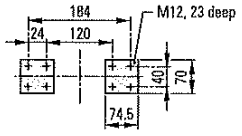
Dimension drawings for current transformers

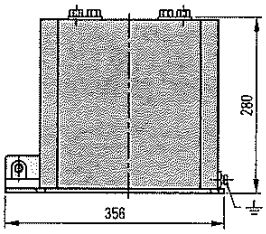


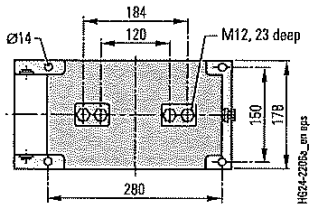


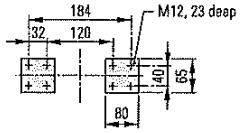


Primary connection ≥ 1500 A

Dimension drawing 1

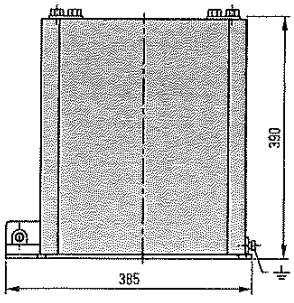


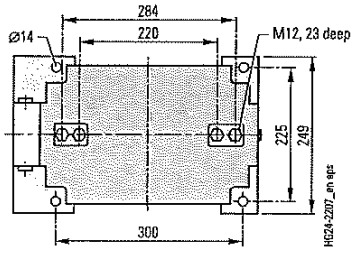


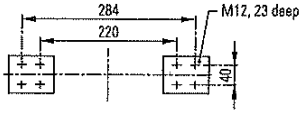


Dimension drawing 2

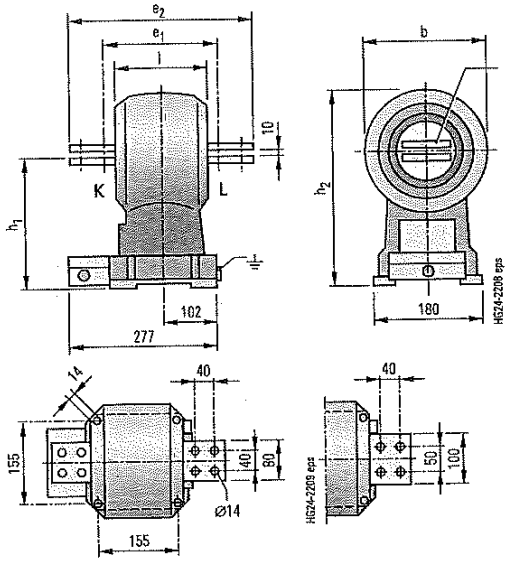
3







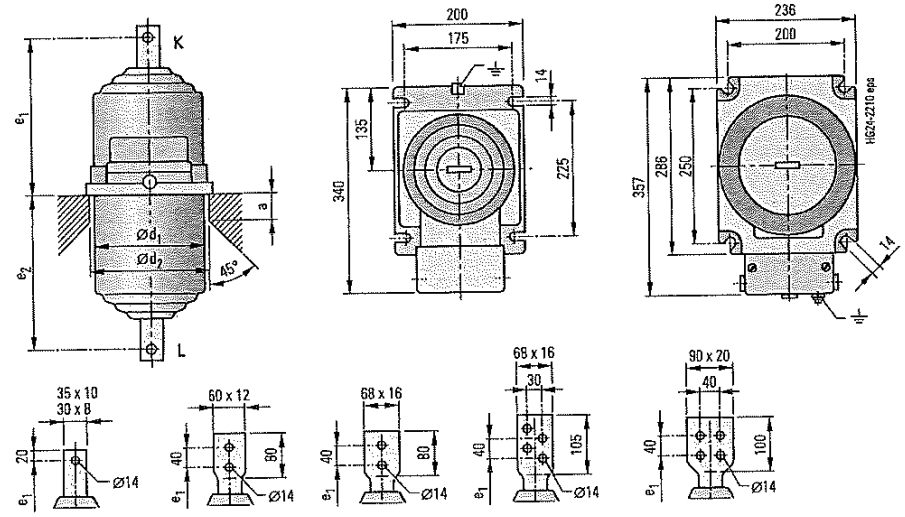
Dimension drawing 3



Type	b	e_1	e_2	h_1	h_2	l
4MB12, size 1	214	210	350	235	342	176
4MB12, size 2	260	230	350	295	425	196
4MB13	273	–	–	288	425	300
4MB14	260	230	350	295	425	196

Current ratings	Bars
Up to 1500 A	2 x 50 x 10
1500 A to 2500 A	2 x 80 x 10
2500 A to 3000 A	2 x 80 x 10 or 3 x 80 x 10
3000 A to 4000 A	3 x 80 x 10 or 3 x 100 x 10

Dimension drawing 4



Dimension drawing 5

Type	Size	a max. mm	d_1 mm	d_2 mm	e_1 up to 1500 A mm	e_1 2000 A mm	e_1 up to 3000 A[1] mm	e_2 up to 1500 A mm	e_2 2000 A mm	e_2 up to 3000 A[1] mm	Weight approx. kg
4MC22	0	50	180	185	190	195	215	150	155	175	12 to 18
	1	60	180	185	190	195	215	210	215	235	16 to 22
	2	115	180	185	255	260	280	270	275	295	28 to 32
	3	195	180	185	315	320	340	330	335	355	35 to 40
	21	150	230	235	280	285	315	290	295	325	40 to 48
4MC24	1	60	180	185	255	260	280	270	275	295	28 to 32
	2	140	180	185	315	320	340	330	335	355	35 to 40
	11	100	230	235	280	285	315	290	295	325	40 to 48
4MC26	1	60	180	185	315	320	340	330	335	355	35 to 40
	01	50	230	253	280	285	315	290	295	325	40 to 48

1) Design for rated primary current 3000 A only available in size 21, 11 or 01

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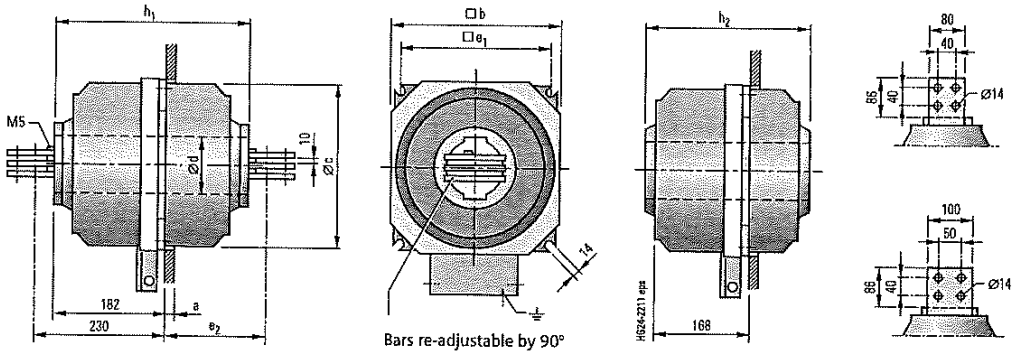


Dimension drawing 6

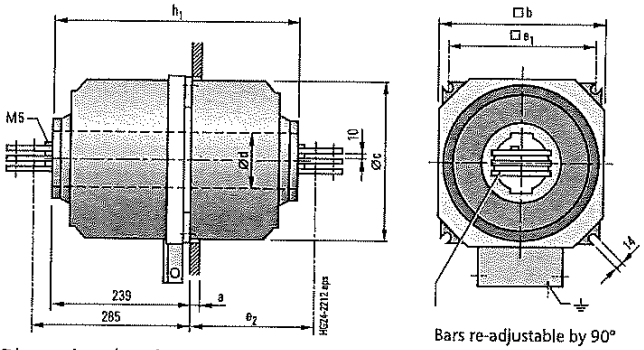
Size	a_{max}	b	Ø c	Ø d	e_1	e_2	h_1	h_2
11	10	295	278	115	255	175	313	285
12	60	295	278	115	255	250	288	360
21	10	370	356	115	325	175	313	285
22	60	370	356	115	325	250	288	360
31	10	370	356	155	325	–	–	285
32	60	370	356	155	325	–	–	360
41	10	440	440	205	490	–	–	285
42	60	440	440	205	490	–	–	360
51	10	530	530	297	490	–	–	285
52	60	530	530	297	490	–	–	360
61	10	530	530	310	490	–	–	–
62	60	530	530	310	490	–	–	–
72	10	650	650	380	600	–	–	–
73	60	650	650	380	600	–	–	–

Conductor bars

Normal designs

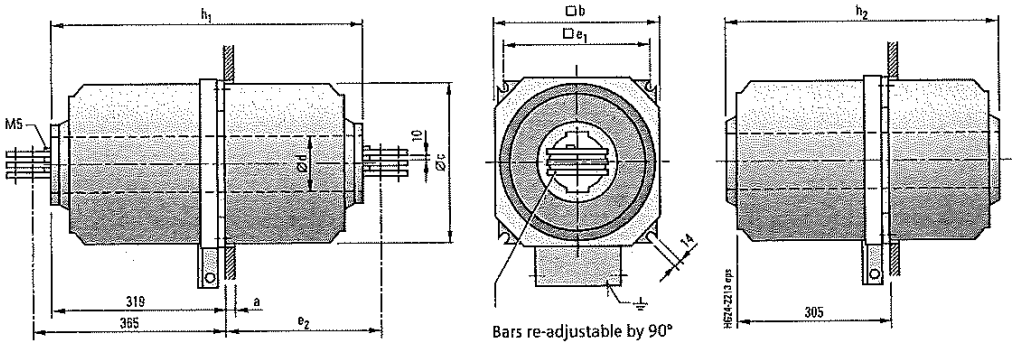
2000 A: 2 bars, 80 x 10 mm
2500 A: 2 bars, 100 x 10 mm
3000 A: 3 bars, 80 x 10 mm
4000 A: 3 bars, 100 x 10 mm

3



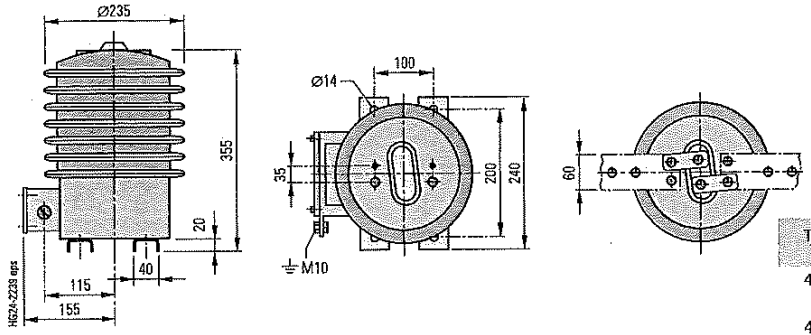
Dimension drawing 7

Size	a_{max}	b	Ø c	Ø d	e_1	e_2	h_1	h_2
11	10	295	278	115	255	230	427	399
12	60	295	278	115	255	305	502	474
21	10	370	356	115	325	230	427	399
22	60	370	356	115	325	305	50	474
31	10	370	356	155	325	–	–	399
32	60	370	356	155	325	–	–	474
41	10	440	440	205	490	–	–	399
42	60	440	440	205	490	–	–	474
51	10	530	530	297	490	–	–	399
52	60	530	530	297	490	–	–	474
61	10	530	530	310	490	–	–	399
62	60	530	530	310	490	–	–	474
72	10	650	650	380	600	–	–	–
73	60	650	650	380	600	–	–	–



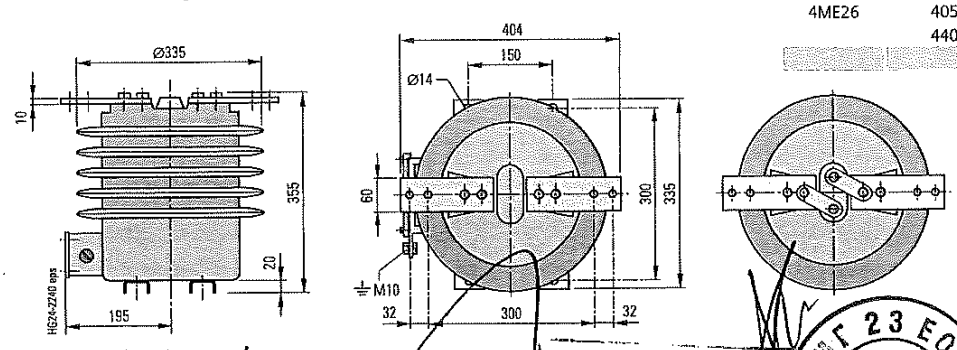
Dimension drawing 8

Size	a_{max}	b	Ø c	Ø d	e_1	e_2	h_1	h_2
11	10	295	278	115	255	175	313	285
12	60	295	278	115	255	250	288	360
21	10	370	356	115	325	175	313	285
22	60	370	356	115	325	250	288	360
31	10	370	356	155	325	–	–	285
32	60	370	356	155	325	–	–	360
41	10	440	440	205	490	–	–	285
42	60	440	440	205	490	–	–	360
51	10	530	530	297	490	–	–	285
52	60	530	530	297	490	–	–	360
61	10	530	530	310	490	–	–	–
62	60	530	530	310	490	–	–	–
72	10	650	650	380	600	–	–	–
73	60	650	650	380	600	–	–	–



Dimension drawing 9

Type	Arcing distance	Creepage distance
4ME22	229	486
	310	400
4ME24	229	486
	440	1010
4ME26	405	945
	440	1010



Dimension drawing 10

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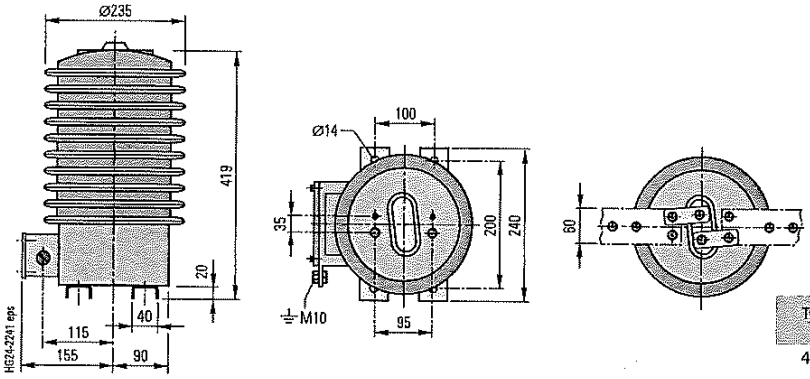
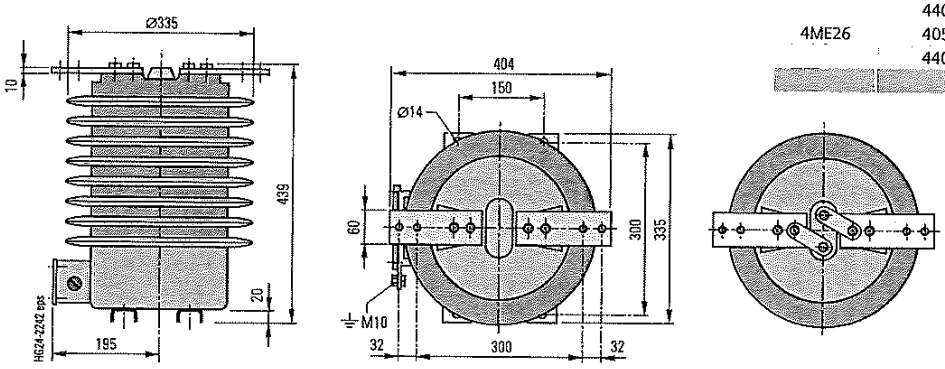
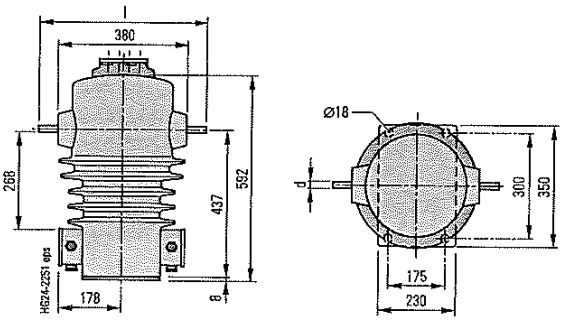


Dimension drawing 11

Type	Arcing distance	Creepage distance
4ME22	229	486
	310	400
4ME24	229	486
	440	1010
4ME26	405	945
	440	1010

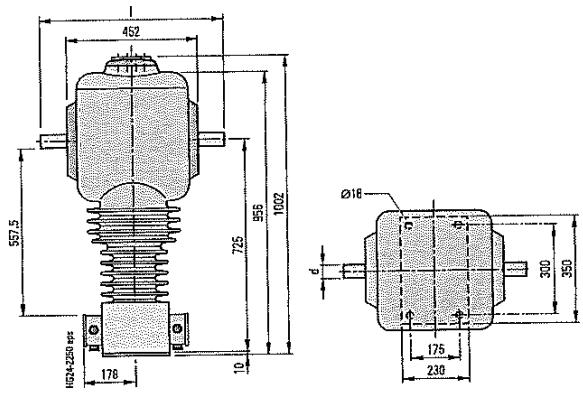


Dimension drawing 12



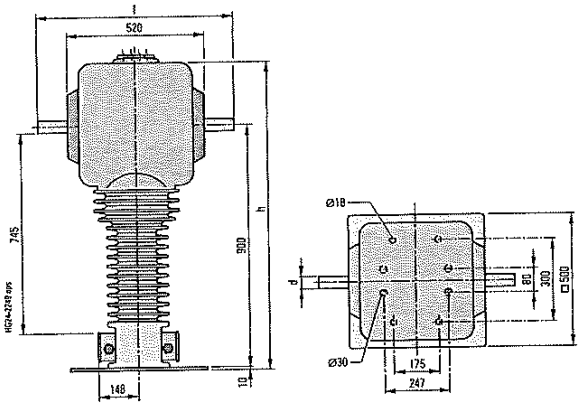
Dimension drawing 13

I_{PN}	d	l	Arcing distance	Creepage distance
Up to 600 A	20	500	268	665
600 to 1250 A	30	560	268	665
1250 to 2000 A	42	600	268	665
2000 to 3000 A	48	620	268	665



I_{PN}	d	l	Arcing distance	Creepage distance
Up to 600 A	20	572	557.5	1290
600 to 1250 A	30	632	557.5	1290
1250 to 2000 A	42	672	557.5	1290
2000 to 3000 A	48	692	557.5	1290

Dimension drawing 14



I_{PN}	d	l	h	Arcing distance	Creepage distance
500 A	30	700	1125	745	1823
Up to 1250 A	30	700	1188	745	1823
1250 to 2000 A	42	740	1188	745	1823
2000 to 3000 A	45	760	1188	745	1823
2x 600 A	30	700	1217	745	1823

Dimension drawing 15

Terminal designations of current transformers

Transformer design	Designation of connection terminals acc. to VDE	acc. to IEC	Example for rated current data
1 primary winding	K L	P1 P2	100/1 A
1 secondary winding	k l HG24-2216 eps	S1 S2 HG24-2217 eps	
2 equivalent primary windings	Ka Kb La Lb	P1 C1 C2 P2	2 x 100/1 A
1 secondary winding	k l HG24-2218 eps	S1 S2 HG24-2219 eps	
	with primary multi-ratio		
1 primary winding	K L	P1 P2	1000–800 ... 200/1A
1 secondary winding with tappings	k l3 l2 l1 HG24-2220 eps	S1 S2 S3 S4 HG24-2221 eps	
	with secondary multi-ratio, highest rated current at l1 or S4		
1 primary winding	K L	P1 P2	100/1/1 A
2 or more secondary windings on separate cores	1k 1l 2k 2l HG24-2222 eps	1S1 1S2 2S1 2S2 HG24-2223 eps	

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MIG 23 EOOD СОФИЯ MIG 23 LTD.

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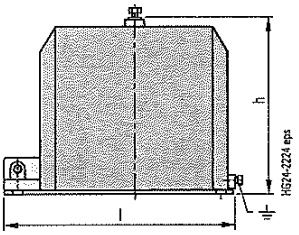
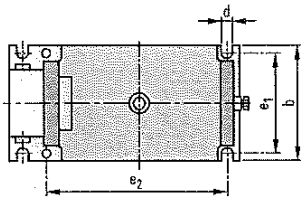
Order No.	Operating voltage (maximum value) U_m kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated lightning impulse withstand voltage U_p kV	Rated frequency Hz	Maximum rated primary voltage U_{PN} kV	Multi-ratio U_{SN} kV	Thermal limiting output S_{th} VA	Rated voltage factor (8h)	Rated thermal limiting output of the residual voltage winding VA/A	Short-time load (mechanical) N	Weight kg	Catalog dimension drawing
4MR12	12	28	75	50/60	$11.5/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	350	1.9	230/4	–	18	16
4MR14	24	50	125	50/60	$22/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	500	1.9	230/4	–	28	16
4MR22	12	28	75	50/60	11.5	100; 110; 120	400	–	–	–	18	17
4MR24	24	50	125	50/60	22	100; 110; 120	400	–	–	–	30	17
4MR52	12	28	75	50/60	$11.5/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	600	1.9	350/6	–	25	18
4MR54	24	50	125	50/60	$22/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	600	1.9	350/6	–	35	18
4MR56	36	70	170	50/60	$35/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	800	1.9	350/6	–	60	18
4MR62	12	28	75	50/60	11.5	100; 110; 120	600	–	–	–	25	19
4MR64	24	50	125	50/60	22	100; 110; 120	600	–	–	–	35	19
4MR66	36	70	170	50/60	35	100; 110; 120	800	–	–	–	70	19
4MS32	12	28	75	50/60	$12/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	400	1.9	230/4	1000	72	20
4MS34	24	50	125	50/60	$22/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	400	1.9	230/4	1000	75	20
4MS36	12	28	75	50/60	$35/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	400	1.9	230/4	1000	79	20
4MS38	52	70	250	50/60	$50/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	800	1.9	500/9	1000	79	20
4MS42	12	28	75	50/60	12	100; 110; 120	500	–	–	1000	73	21
4MS44	24	50	125	50/60	22	100; 110; 120	500	–	–	1000	76	21
4MS46	12	28	75	50/60	35	100; 110; 120	900	–	–	1000	82	21
4MS52	12	28	75	50/60	$12/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	400	1.9	230/4	1000	35.5	22
4MS54	24	50	125	50/60	$22/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	400	1.9	230/4	1000	35.5	22
4MS56	36	28	75	50/60	$35/\sqrt{3}$	$100/\sqrt{3}$; $110/\sqrt{3}$; $120/\sqrt{3}$	400	1.9	230/4	1000	51	23
4MS62	12	28	75	50/60	12	100; 110; 120	500	–	–	1000	37	24
4MS64	24	50	125	50/60	22	100; 110; 120	500	–	–	1000	37	24
4MS66	36	28	75	50/60	35	100; 110; 120	500	–	–	1000	57	25

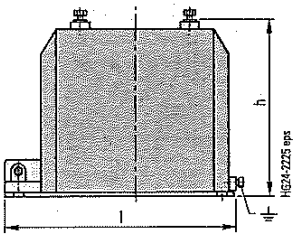
Dimension drawings for voltage transformers

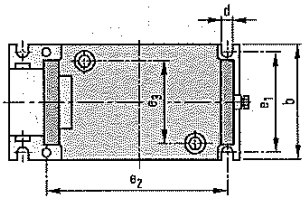




Type	b	h	l	e_1	e_2	d
4MR12	148	220	335	125	270	11
4MR14	178	280	357	150	280	14

Dimension drawing 16

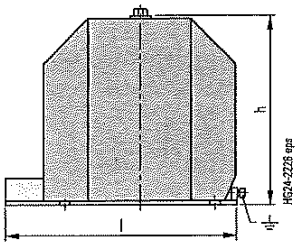


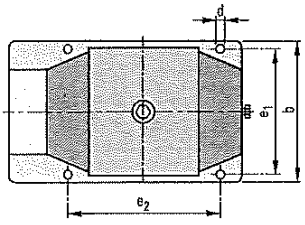


Type	b	h	l	e_1	e_2	e_3	d
4MR12	148	220	335	125	270	110	11
4MR14	178	280	357	150	280	130	14

Dimension drawing 17

3

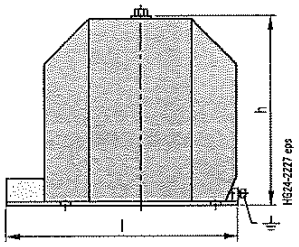


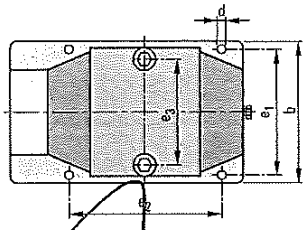


Type	b	h	l	e_1	e_2	d
4MR52	200	240	342	175	225	11
4MR54	225	300	370	200	250	14
4MR54 [1]	200	300	324	175	225	14
4MR56	249	390	395	225	300	14

1) Design on request

Dimension drawing 18





Type	b	h	l	e_1	e_2	e_3	d
4MR62	200	240	342	175	225	150	11
4MR64	225	300	370	200	250	210	14
4MR64 [1]	200	260	324	175	225	155	14
4MR66	249	390	395	225	300	320	14

1) Design on request

Dimension drawing 19

ВЯРНО С ОРИГИНАЛА
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СОФИЯ
MIG 23 LTD

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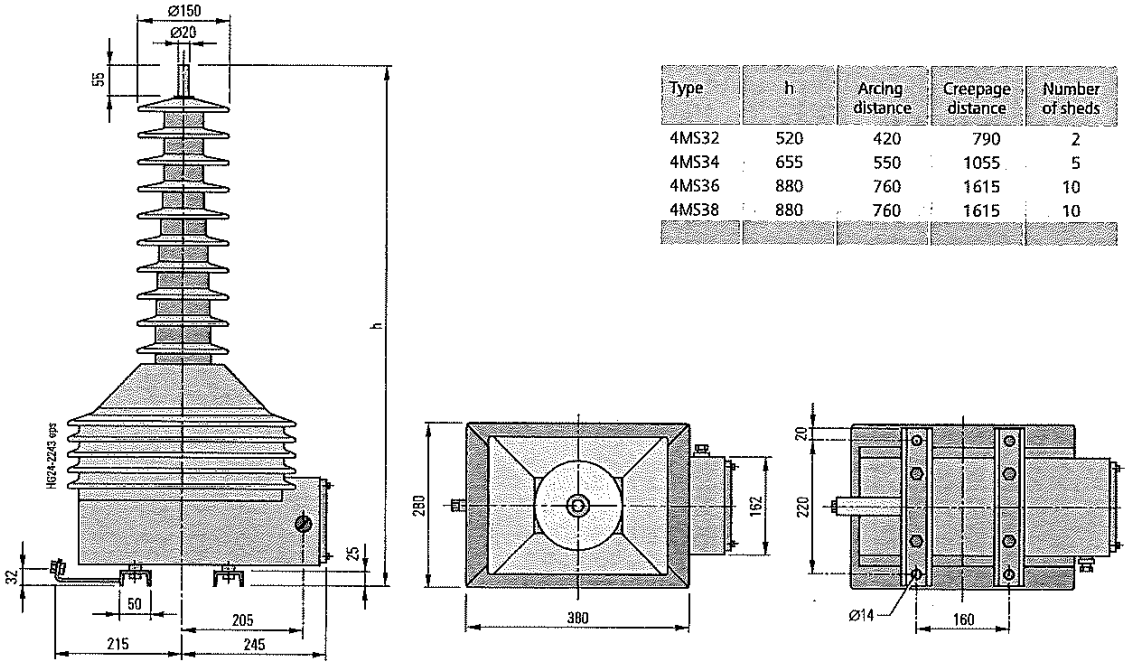
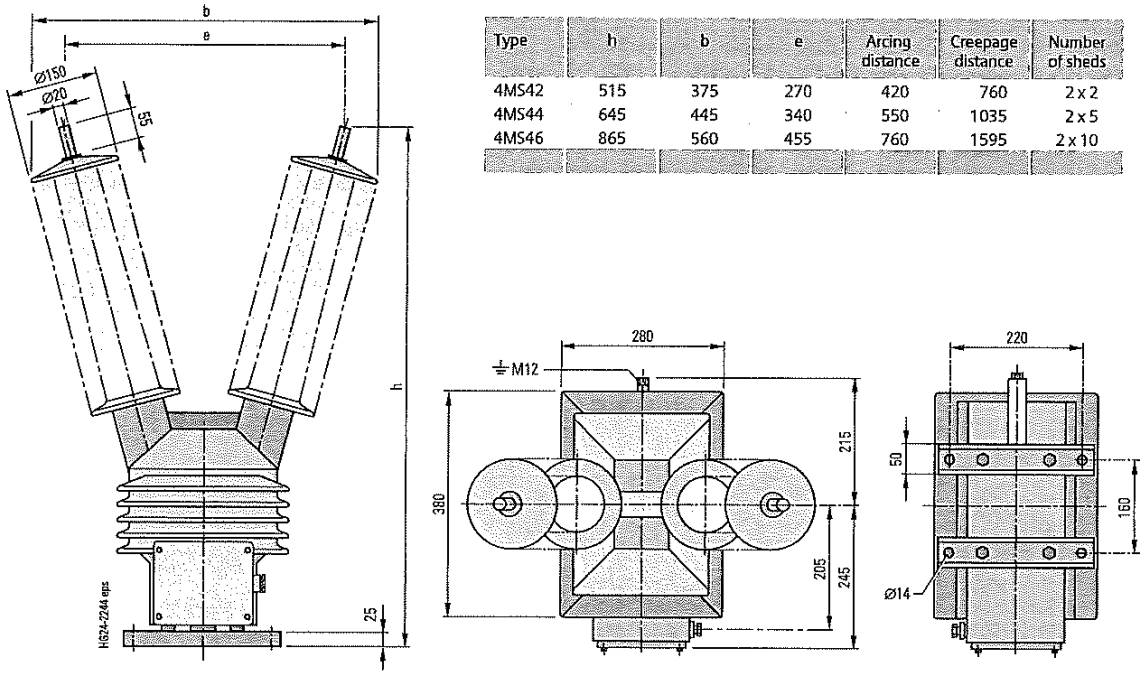


Type	h	Arcing distance	Creepage distance	Number of sheds
4MS32	520	420	790	2
4MS34	655	550	1055	5
4MS36	880	760	1615	10
4MS38	880	760	1615	10

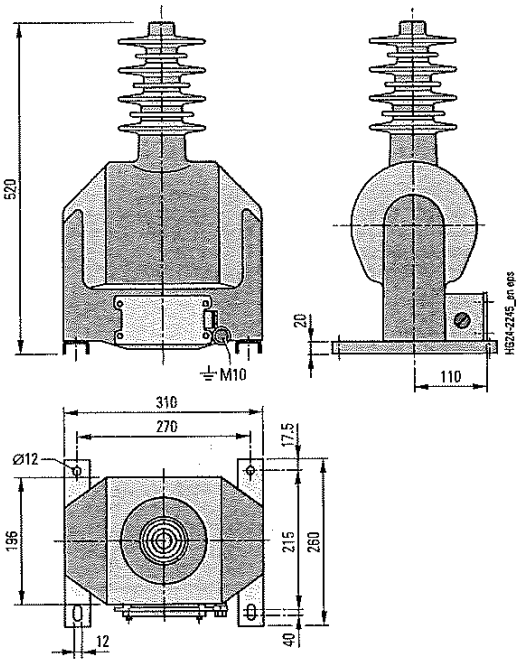
Dimension drawing 20

3

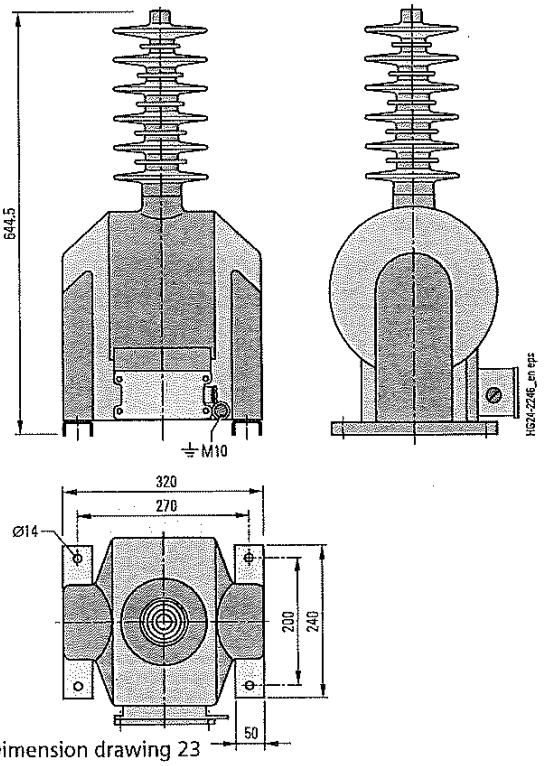


Type	h	b	e	Arcing distance	Creepage distance	Number of sheds
4MS42	515	375	270	420	760	2 x 2
4MS44	645	445	340	550	1035	2 x 5
4MS46	865	560	455	760	1595	2 x 10

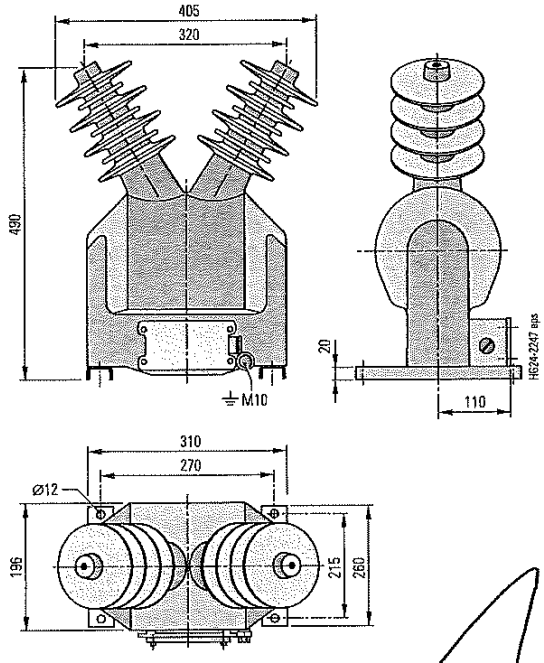
Dimension drawing 21



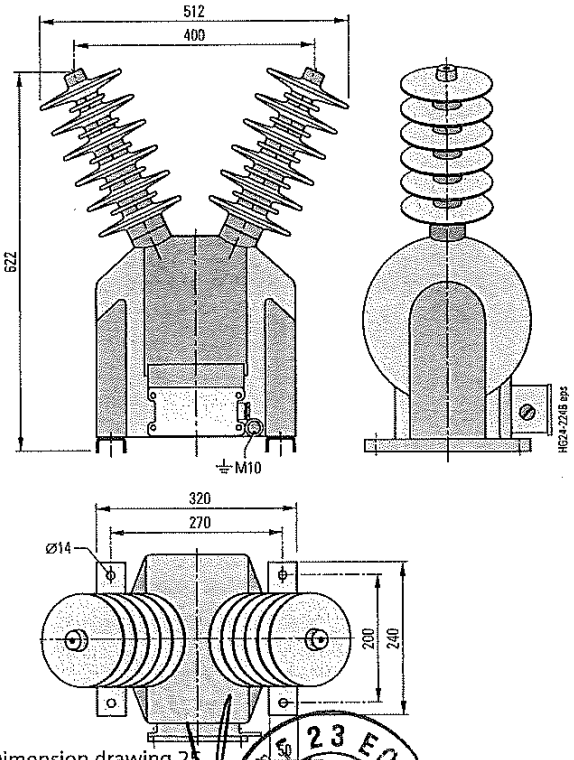
Dimension drawing 22



Dimension drawing 23



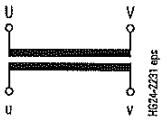
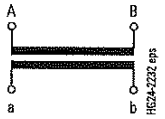
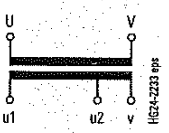
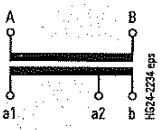
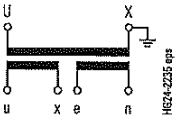
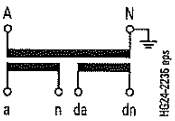
Dimension drawing 24



Dimension drawing 25

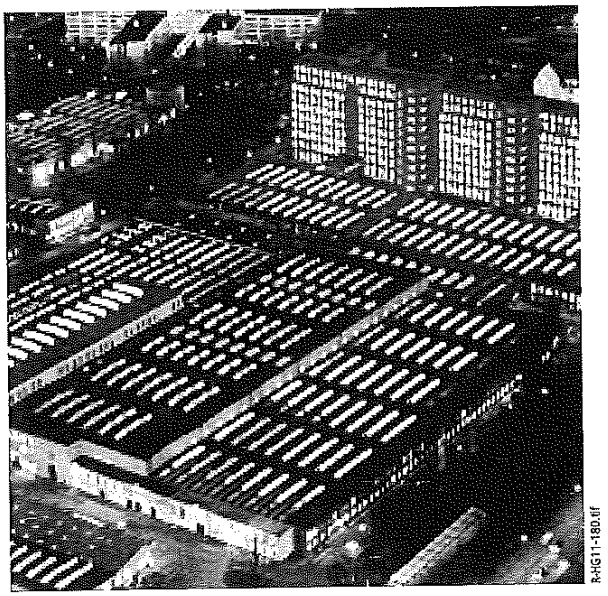
ВЯРНО С ОРИГИНАЛА
MIG 23 LTD
СОФИЯ
000203

Terminal designations of the voltage transformers

Transformer design	Designation of the connection terminals acc. to VDE	Designation of the connection terminals acc. to IEC	Example for low-voltage data
Unearthed 1 secondary winding			10000/100 V
Unearthed 1 secondary winding with tappings			5000–10000/100 V
	highest rated voltage at u1 or a1		
Earthed 1 measuring winding 1 auxiliary residual voltage winding			10000/$\sqrt{3}$ / 100/$\sqrt{3}$ / 100/3 V

3

Brandenburg Gate, Berlin, Germany



Switchgear Factory Berlin, Germany

Contents

4

ВЯРНО С ОРИГИНАЛА
MIG 23 LTD СОФИЯ

000204

Please copy, fill in and return to your Siemens partner.

Inquiry concerning

- ☐ 4MA7 current transformer
- ☐ 4MB1 current transformer
- ☐ 4MC2 current transformer
- ☐ 4MC3 current transformer
- ☐ 4ME2 current transformer
- ☐ 4ME3 current transformer
- ☐ 4MR voltage transformer
- ☐ 4MS voltage transformer

Please

- ☐ Submit an offer
- ☐ Call us
- ☐ Visit us

Your address

Company

Dept.

Name

Street

Postal code/city

Phone

Fax

E-mail

Siemens AG

Dept.

Name

Street

Postal code/city

Fax

Technical data of current transformer

				Other values
Operating voltage	☐ 12 kV ☐ 36 kV	☐ 17.5 kV ☐ 52 kV	☐ 24 kV	☐ ___ kV
Rated lightning impulse withstand voltage	☐ 75 kV ☐ 170 kV	☐ 95 kV ☐ 250 kV	☐ 125 kV	☐ ___ kV
Rated short-duration power-frequency withstand voltage	☐ 28 kV ☐ 70 kV	☐ 38 kV ☐ 95 kV	☐ 50 kV	☐ ___ kV
Rated primary current	☐ ___ A	☐ 2x___ A		
Secondary current	☐ 1 A	☐ 5 A		
Thermal strength	☐ 100 x I_{PN} ☐ 300 x I_{PN} ☐ 600 x I_{PN}	☐ 150 x I_{PN} ☐ 400 x I_{PN} ☐ 800 x I_{PN}	☐ 200 x I_{PN} ☐ 500 x I_{PN} ☐ 1000 x I_{PN}	☐ ___ x I_{PN}
1st core	☐ Protection core ☐ Measuring core	☐ ___ Class ☐ ___ Class	☐ ___ Factor ☐ ___ Factor	☐ ___ VA ☐ ___ VA
2nd core	☐ Protection core ☐ Measuring core	☐ ___ Class ☐ ___ Class	☐ ___ Factor ☐ ___ Factor	☐ ___ VA ☐ ___ VA
3rd core	☐ Protection core ☐ Measuring core	☐ ___ Class ☐ ___ Class	☐ ___ Factor ☐ ___ Factor	☐ ___ VA ☐ ___ VA

Technical data of voltage transformer

				Other values
Maximum operating voltage	☐ 12 kV ☐ 36 kV	☐ 24 kV ☐ 52 kV		☐ ___ kV
Rated lightning impulse withstand voltage	☐ 75 kV ☐ 170 kV	☐ 95 kV ☐ 250 kV	☐ 125 kV	☐ ___ kV
Rated short-duration power-frequency withstand voltage	☐ 28 kV ☐ 70 kV	☐ 38 kV ☐ 95 kV	☐ 50 kV	☐ ___ kV
Rated primary voltage	☐ ___ kV	☐ ___ $/\sqrt{3}$		
Rated secondary voltage	☐ 100 V ☐ 100/$\sqrt{3}$ V	☐ 110 V ☐ 110/$\sqrt{3}$ V	☐ 120 V ☐ 120/$\sqrt{3}$ V	☐ ___ V ☐ ___ /$\sqrt{3}$ V
Auxiliary residual voltage winding	☐ Without	☐ 100/3 V	☐ 110/3 V	☐ 120/3 V
Rated output of the measuring winding	☐ Class 0.2 ☐ 20 VA	☐ Class 0.5 ☐ 50 VA	☐ Class 1 ☐ 100 VA	☐ ___ VA

Application and other requirements

☐ Please check off ___ Please fill in

You prefer to configure your instrument t[illegible]rmer on your own?

Please follow the steps for configuration and enter t[illegible]r number in the configuration aid.

Instruction for configuration of the 4M protective and measuring transformers

1st step: Definition of the current transformer

Please specify the following ratings:	Possible options:
Transformer design	Block-type transformer, bushing-type transformer, outdoor transformer, etc.
Operating voltage (U_m)	U_m: 12 kV to 52 kV
Rated lightning impulse withstand voltage (U_p)	U_p: 75 kV to 250 kV
Rated short-duration power-frequency withstand voltage (U_d)	U_d: 28 kV to 95 kV
Rated primary current (I_{PN})	I_{PN}: 20 A to 10000 A
Secondary current (I_{SN})	I_{SN}: 1 A or 5 A
Thermal strength	100 x I_{PN} to 1000 I_{PN}
Core data	Quantity, type, class, factor and rating of cores

These ratings define the positions 3 to 15 of the order number of the current transformer.

2nd step: Definition of the voltage transformer

Please specify the following ratings:	Possible options:
Transformer design	Block-type transformer, outdoor transformer
Number of phases	Single-phase or double-phase
Operating voltage (U_m)	U_m: 12 kV to 52 kV
Rated lightning impulse withstand voltage (U_p)	U_p: 75 kV to 250 kV
Rated short-duration power-frequency withstand voltage (U_d)	U_d: 28 kV to 95 kV
Rated primary voltage (U_{PN})	U_{PN}: 3.3 kV to 45 kV or values divided by $\sqrt{3}$
Rated secondary voltage (U_{SN})	U_{SN}: 100 V, 110 V, 120 V or values divided by $\sqrt{3}$
Rated output of the measuring winding	25 VA, class 0.2 up to 400 VA, class 1

These ratings define the positions 3 to 11 of the order number of the voltage transformer.

3rd step: Do you have any further requirements concerning the equipment?

Should you still need more options than the possible equipment like terminal designations according to VDE or IEC, selection of sizes, routine test certificate, etc., please contact your responsible sales partner.

For configuration of your
4M protective and measuring transformers

1 2 3 4 5 6 7 – 8 9 10 11 12 – 13 14 15 16

4 M ■ ■ ■ ■ ■ – ■ ■ ■ ■ ■ – ■ ■ ■ ■ – Z

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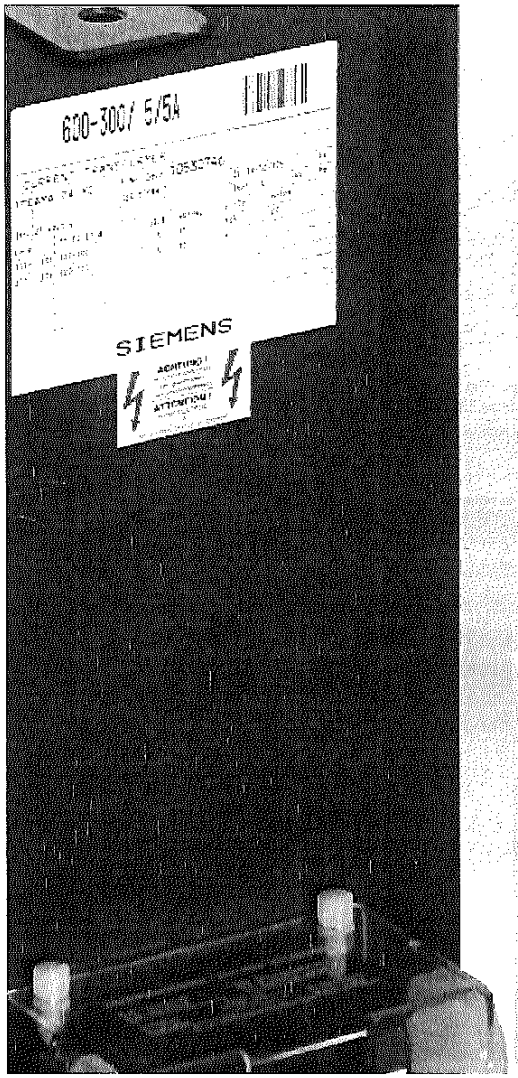
ВЯРНО С ОРИГИНАЛА

МИГ 23 ЕООД СОФИЯ MIG 23 LTD

000205



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91058 Erlangen, Germany

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Energy Sector
Power Distribution Division
Medium Voltage
Nonnendammallee 104
13623 Berlin, Germany

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Fax: +49 180 524 24 71
(Charges depending on provider)
E-mail: support.energy@siemens.com

Order No. E50001-K1524-A101-A3-7600
Printed in Germany
Dispo 31601, c4bs 7460
KG 05.09 2.0 88 En
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Printed on elementary chlorine-free bleached paper.

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Responsible for

Technical contents:
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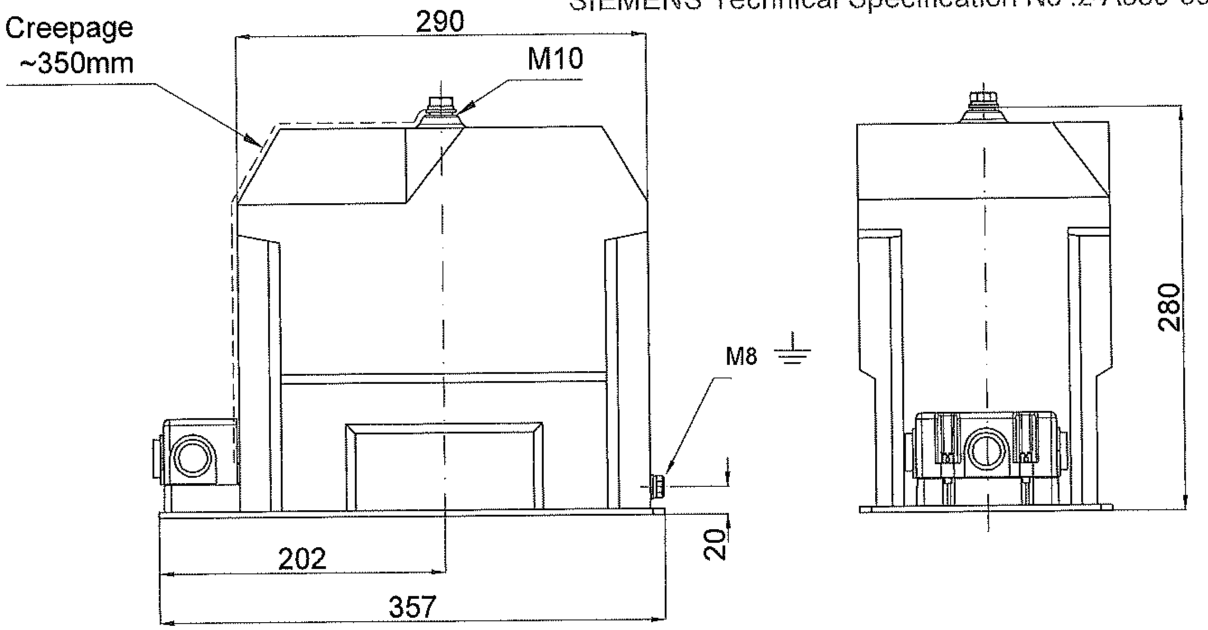
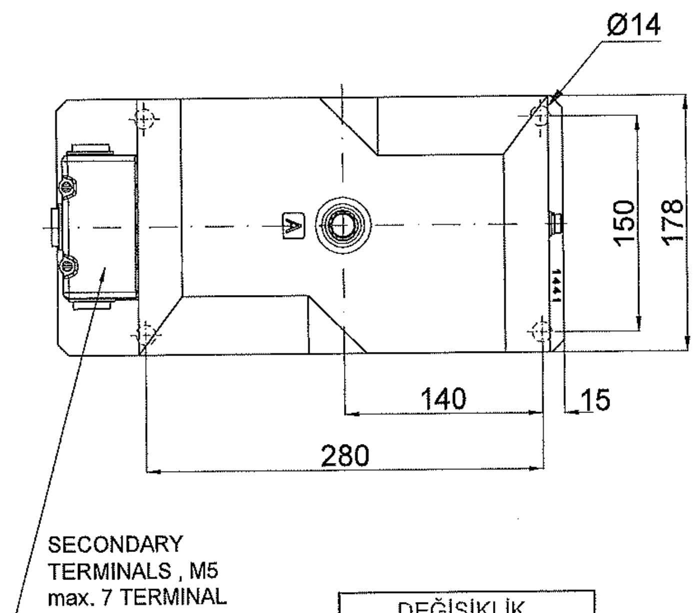
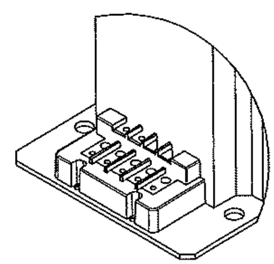




SCREW	TORQUE Nm
M5	4
M8	16-20
M10	30-40



SECONDARY TERMINAL'S DETAIL

DEĞİŞİKLİK
TEKNİK BÜRO
Tarih 20 / 02 / 2014

QTY	DESCRIPTION	POS	DIMENSIONS	WEIGHT	PART OR DIN NO.	MATERIAL

NO	DATE	NAME	MODIFICATION
G	09-11-10	AYSE	Procedure no changed
H	20-02-14	AYŞE	Secondary terminals changed.

14-12-04

PLATE CODE	3001441
BOX CODE	3003005

REV. H

TOLERANCES
DIN ISO 2768-g

SCALE
1/1

4MR14
VOLTAGE TRANSFORMER
SIEMENS

REPLACES THE DRAWING NO.

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DR'N
CH'D
APP'D

ALCE TRANSFORMING SUPPORTING

OG Ölçü Trafo

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